

**This document was too large to scan
as a single document. It has
been divided into smaller sections.**

Section 4 of 4

Document Information			
Document #	RPP-24544	Revision	1C
Title	DEMONSTRATION BULK VITRIFICATION SYS INDEPENDENT QUALIFIED REGISTERED PROFESSIONAL ENGINEER (IQRPE) & RCRA REVIEW PACKAGE		
Date	04/25/2006		
Originator	SHUFORD DH	ORG CO	CH2M
Recipient		Recipient Co.	
References			
Keywords			
Projects			
Other Information			

amec

TECHNICAL ENGINEERING CHANGE NOTICE (TECN)

145579 FINAL DBVS DESIGN

TECN No.: D-DS-047.1.R00.1

DOCUMENT(S) AFFECTED BY CHANGE

Document No. of affected Docs.	Rev	Title:
145579-D-DS-047.1	0	Ceramic Sleeve and Collar

Originator: Glyn Jones

Date: April 8, 2005

BASIS OF CHANGE:

Changes made as a result of comments received on the Design Review Package for the ICV System - Package #6.

DESCRIPTION OF CHANGE:

See attached 3 pages.

AREA/DISC. LEAD:

TRL ENG. MNGR. (JDS/TH):

AMEC E&E (M. Lucas):

CLIENT APPROVAL:

DATE: 08/04/05

DATE: April 8/05

DATE: 04/11/05

DATE: 7/12/05

**TECHNICAL DATA SHEET**

PROJECT:	Final DBVS Design	TECN: D-DS-047.1.R00.1
PROJECT NO.:	145579	Ceramic Sleeve and Collar
CLIENT:	AMEC E&E - Richland, Washington	EQUIPMENT NO. N/A

REFERENCE SPECIFICATION

Document No.	Specification
N/A	N/A

CONTENTS

Data Sheet _____ 1 Page

Bidders Drawing & Data Commitments Sheet _____ 1 Page

ATTACHMENTS

Drawing F-145579-35-D-0010 Rev. C _____ 1 Page

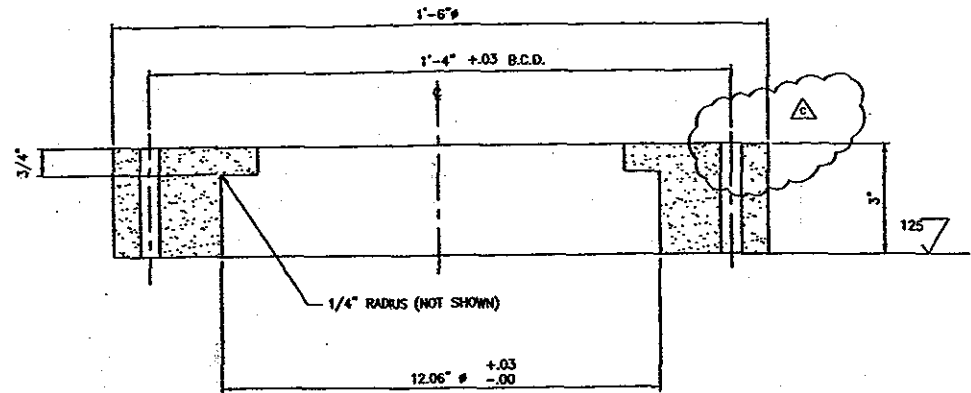
Drawing F-145579-35-D-0005 Rev. D _____ 1 Page

PROJECT:		Final DBVS Design		TECN: D-DS-047.1.R00.1	
PROJECT NO.:		145579		Electrode Ceramic Sleeve and Collar	
CLIENT:		AMEC E&E - Richland Washington		EQ. NO.: N/A	
No. Required		110		ICV Box	
Reference Drawing:		F-145579-35-D-0010		Stream No.	
Reference Specification:		N/A		Quality Assurance Level	
Operating Conditions		Rev		Rev	
Location (Indoors/Outdoors)		Indoors		Environmental Conditions	
Operation (Continuous / Intermittent)		continuous		Working Temperature (F)	
Days per year		365		Relative Humidity Range (%)	
Hours per day		24		Availability (%)	
Noise Level Allowable per 8 hr shift (dB - Lex)		85		Environment - Radioactive	
Shift Length (hrs)		8		- Toxic	
Noise Level Allowable (dB)		85		- Corrosive	
Site Elevation (ft)		663		- Flammable	
Ceramic Information		Item 1: Ceramic Collar Details			
Manufacturer *		No. of thru holes		8	
Model No. *		Size of thru holes (in)		9/16	
Material *		Dimensions			
		- See attached drawing for dimensions			
Operating Voltage (V)		2500			
Bulk Density (lb/ft ³) *		B		Item 2: Ceramic Sleeve Details	
Tensile Strength (psi) *		B		No. of thru holes	
Flexural Strength (psi) *		B		Size of thru holes (in)	
Elastic Modulus (psi) *		B		Dimensions	
Hardness (psi) *				- See attached drawing for dimensions	
Porosity (%) *					
Max. Working Temperature (F) *				Item 3: Ceramic Bolt Details	
Coefficient of Thermal Expansion *				Diameter of Bolts (in)	
Thermal Conductivity (W/m ² K) *		24		Length of Bolt (in)	
Dielectric Strength (ac-kv/mm) *		9.2		Length of thread (minimum) (in)	
Dielectric Constant *		9		Quantity required	
Volume Resistivity (Ohm-cm) *				8/set	
Loss Factor *				Shear load/bolt (lb)	
Dissipation Factor *				Torque per bolt (lbs.ft)	
Mechanical Loading Data:					
Shear load/ cap clamping bolt (lbs)		70		Max. Allowable Torque *	
Tightening Torque on Bolts (lbs. ft.)		5		Shear Strength *	
Force on cap due to turning moment of electrode (lbs)		575/side			
Weight					
Total Shipping Weight (lbs) *				Operating Weight (lbs) *	
Comments:					
1. Items marked with an * shall be filled in by VENDOR					
2. See attached drawing 145579-35-D-0010 for details					
Date	10-Feb-05	21-Feb-05	18-Mar-05		
By	GJ	GJ	GJ		
Chkd	FS	FS			
Rev.	A	B	0		

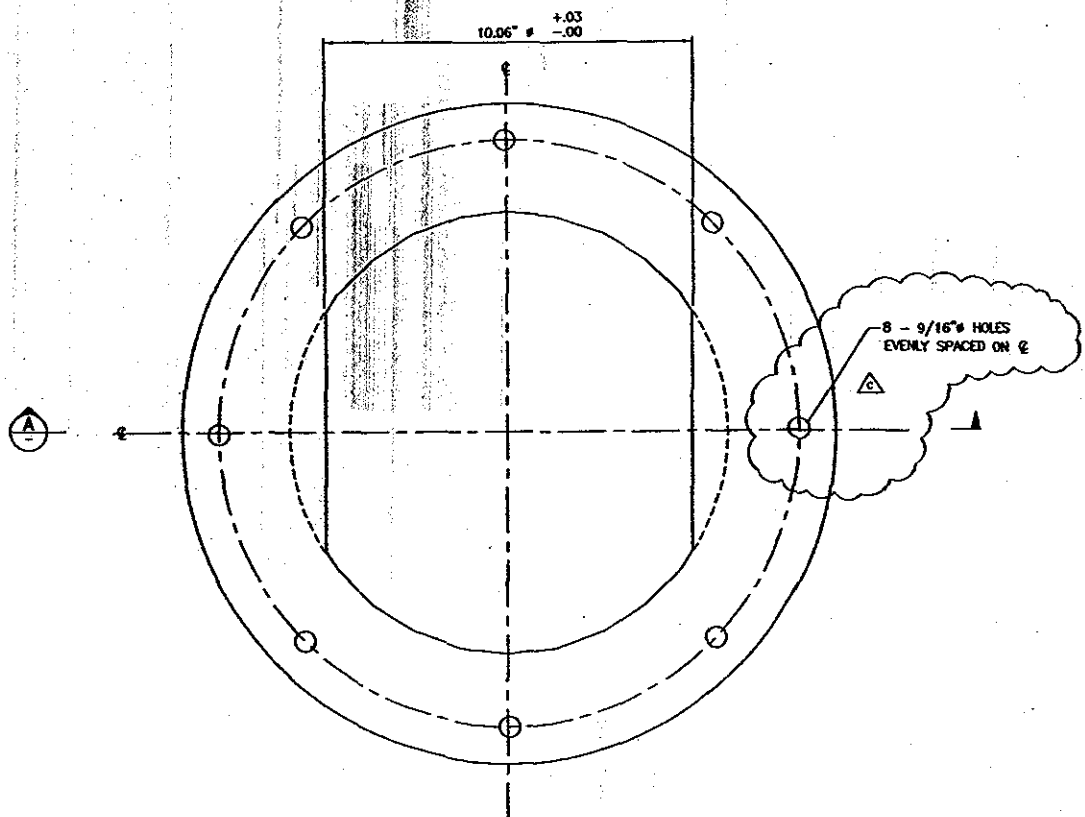
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No.	AMEC Proj. No.	REFERENCE DRAWINGS
1	F-145579-35-D-0004	ICV BOX DATA SHEET
2	F-145579-35-D-0005	ICV BOX LID ASSEMBLY

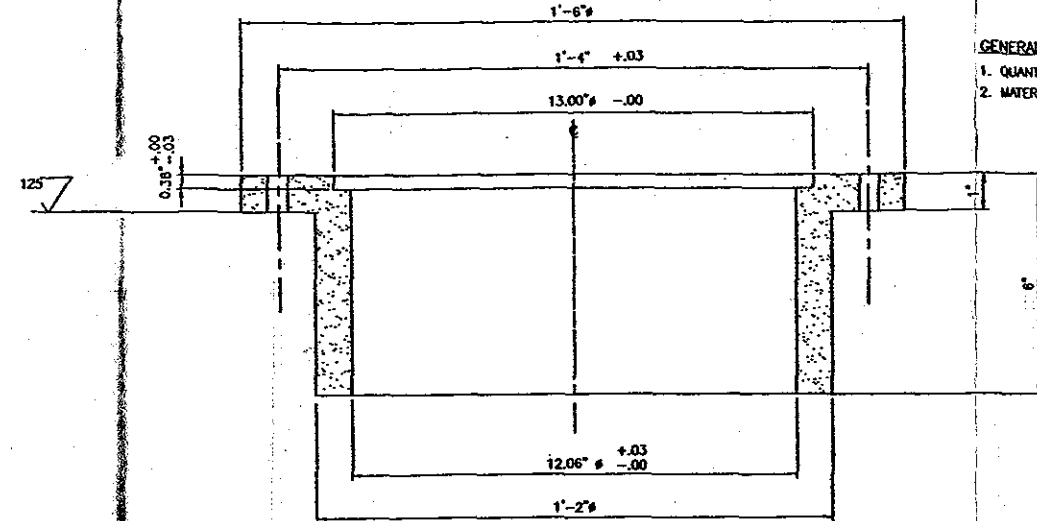
- GENERAL NOTES:
1. QUANTITIES MARKED FOR ITEMS REPRESENT TOTAL FOR '1' ICV BOX LID ONLY
 2. MATERIALS: TYPE OF CERAMIC TO BE RECOMMENDED BY VENDOR



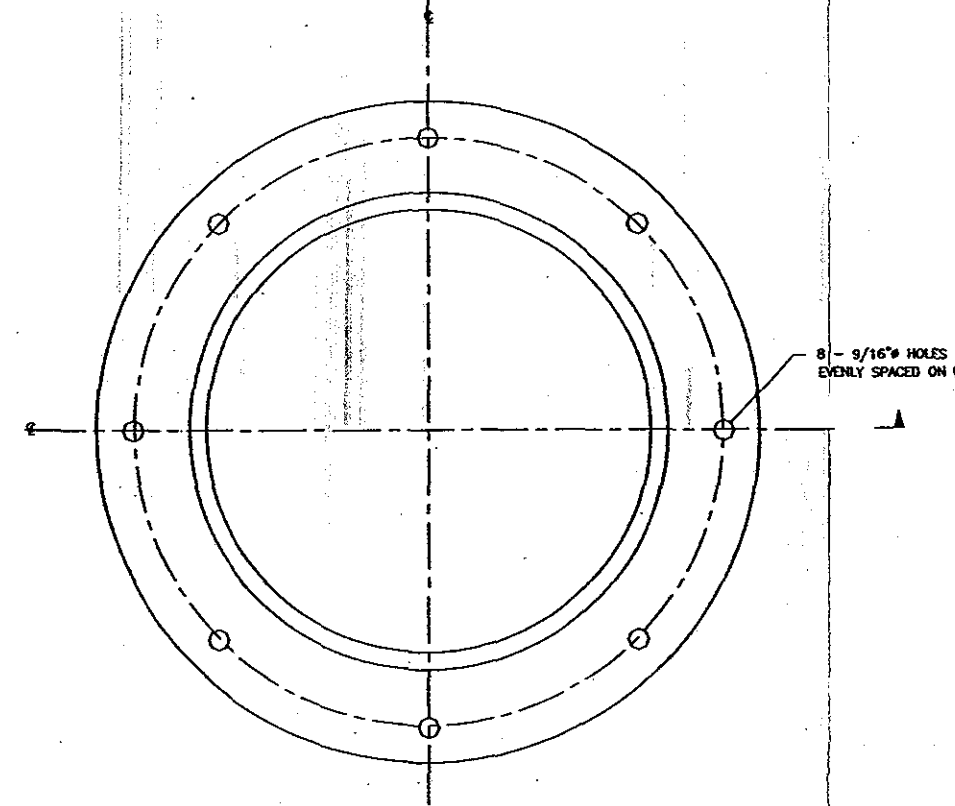
SECTION A
SCALE 6"=1'-0"



UPPER CERAMIC COLLAR - '2' REQ'D
SCALE 6" = 1'-0"
MATERIAL: CERAMIC (TYPE TO BE ADVISED)
LOCATION: SEE REF 2



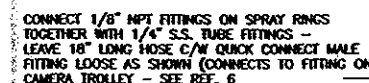
SECTION B
SCALE 6"=1'-0"



LOWER CERAMIC SLEEVE - '2' REQ'D
SCALE 6" = 1'-0"
MATERIAL: CERAMIC (TYPE TO BE ADVISED)
LOCATION: SEE REF 2

C. REVISED - ISSUED FOR CH2M HILL REVIEW AND BOX REPORT		04 APR 05	RRB	CL	SC
B. ISSUED FOR CH2M HILL REVIEW AND BOX REPORT		03 MAR 05	RRB	AA	TH
A. ISSUED FOR INTERNAL APPROVAL		09 FEB 05	RRB	TH	TH
REVISION DESCRIPTION		Date	By	CHK'D	APP'D
F-145579-35-D-0010					
amec 145579-FINAL DBVS DESIGN					
U.S. DEPARTMENT OF ENERGY Office of River Protection					
BULK VITRIFICATION ICV BOX LID CERAMIC DETAILS					
DESIGN APPROVAL		DATE	BY	DATE	BY
F					

DWG NO	TITLE	REF NUMBER	TITLE	DESCRIPTION	REV	DATE	BY	CHK'D	APP'D
DRAWING TRACEABILITY LIST									
NEXT USED ON									
REVISED									



GENERAL NOTES:

1. SEE REF. 5 FOR BOTH WELDING CRITERIA AND LIFTING DEVICE INFORMATION
2. OFF GAS PORT TO BE USED AS GROUT INJECTION
3. THE PORT LIDS (EXCEPT FOR BREATHERS) NOT SHOWN FOR CLARITY
4. AMBIENT AIR PORT LID IS C/W HEPA FILTER ATTACHMENT -- SEE REF. 9 FOR DETAIL

F-145579-33-D-0005		145579-FINAL DBYS DESIGN	
NAME		U.S. DEPARTMENT OF ENERGY	
DATE		Office of River Protection	
PROJECT NO.		BULK VITRIFICATION	
PROJECT TITLE		ICV BOX LID	
PROJECT LOCATION		ASSEMBLY	
PROJECT STATUS		DATE	
PROJECT DESCRIPTION		DATE	
PROJECT CONTACT		DATE	
PROJECT APPROVAL		DATE	
PROJECT REVIEW		DATE	
PROJECT ACTION		DATE	
PROJECT COMPLETION		DATE	
PROJECT CLOSURE		DATE	
PROJECT ARCHIVE		DATE	
PROJECT RETIREMENT		DATE	

OWG NO		TITLE	REF NUMBER	TITLE	DESCRIPTION	REV BY	REV DATE	DATE OF	REVISIONS

145579-D-DS-050.1

TECHNICAL DATA SHEET
 AMEC Americas Limited



The document revision number is indicated below. Please replace all revised pages of this document and destroy the superseded copies.

PROJECT:	Final DBVS Design	145579-D-DS-050.1	REV. 1
PROJECT NO.:	145579	ICV Box Lid Seals	
CLIENT:	AMEC E&E - Richland, Washington	EQUIPMENT NO.	NA

REV. NO.	ISSUED FOR	ORIGIN	DATE	INITIAL
A	For Internal Approval	GJ	10-Feb-05	GJ
B	CH2M Hill Review	GJ	21-Feb-05	GJ
0	Bid Request	GJ	21-Mar-05	GJ
1	Bid Request	GJ	22-Mar-05	JJ & GJ

DOCUMENT APPROVAL
CLIENT APPROVAL (AMEC RICHLAND)
Original Approvals on File

Project Manager: *Al Carlson for BB*
 Date: *3/22/05*
 Q.A. Rep.: *[Signature]*
 Date: *3/22/05*

CLIENT APPROVAL (CH2M HILL)

Project Manager: *[Signature]*
 Date: *3/29/05*

AMEC AMERICAS LIMITED (TRAIL)
Original Approvals on File

Project Manager: *J. Brian*
 Date: *Mar 22, 2005*
 Discipline Lead: *K. For RS*
 Date: *2005 03 22*
 Originator: *Glyn Jones*
 Date: *Mar 22, 2005*



TECHNICAL DATA SHEET

PROJECT:	Final DBVS Design	145579-D-DS-050.1	REV. 1
PROJECT NO.:	145579	ICV Box Lid Seals	
CLIENT:	AMEC E&E - Richmond, Washington	EQUIPMENT NO.	N/A

REFERENCE SPECIFICATION

Document No.	Specification
N/A	

CONTENTS

Data Sheet 2 Pages

Bidders Drawing & Data Commitments Sheet 1 Page

ATTACHMENTS

Drawing F-145579-35-D-0019 Rev. B 1 Page

amec

TECHNICAL DATA SHEETS

PROJECT:		Final DBVS Design		145579-D-DS-050.1		REV. 1	
PROJECT NO.:		145579		ICV Box Lid Seals			
CLIENT:		AMEC E&E - Richland Washington		EQ. NO.:		N/A	
No. Required		See individual item		Area		34, 35	
Reference Drawing:		R-145579-35-D-0019		Stream No.		N/A	
Reference Specification:		N/A		Quality Assurance Level		CQ	
Operating Conditions							
Location (Indoors/Outdoors)		Indoors		Environmental Conditions		Rev	
Operation (Continuous / Intermittent)		continuous		Max. Temperature		(F) see indiv. item	
Days per year		365		Relative Humidity Range		(%) 0 to 100	
Hours per day		24		Availability		(%) 95	
Noise Level Allowable per 8 hr shift (dB - Lex)		85		Environment		- Radioactive	
Shift Length (hrs)		8				- Toxic	
Noise Level Allowable (dB)		85				- Corrosive	
Site Elevation (ft)		663				- Flammable	
						No	
Seal Information							
Item 1: Ceramic/Electrode Seal				Item 2: Chute Nozzle Tadpole Seal			
Material		*		Material		*	
Model		*		Model		*	
Dimensions:				Type		*	
See Attached Drawing for Dimensions				Dimensions:			
				See Attached Drawing for Dimensions			
Operating Pressure Differential (ins. W.G.)		+/- 2.5		Operating Pressure Differential (ins. W.G.)		+/- 2.5	
Max. Allowable Leakage Rate (ft. ³ /hr./lin. ft.)		6		Max. Allowable Leakage Rate (ft. ³ /hr./lin. ft.)		6	
Max. Operating Temperature (F)		2372		Max. Operating Temperature (F)		1300	
Max. Temperature Rating (F)		*		Max. Temperature Rating (F)		*	
Density (lbs/ft. ³)		*		Density (lbs/ft. ³)		*	
Tensile Strength (psi)		B		Tensile Strength (psi)		B	
Flexural Strength (psi)		B		Flexural Strength (psi)		B	
Thermal Resistance (R-value)		*		Thermal Resistance (R-value)		*	
Number Required		120		Number Required		300	
Total Shipping Weight (lbs)		*		Total Shipping Weight (lbs)		*	
Item 3: Ceramic Sleeve Gasket				Item 4: ICV Box Lid Seal			
Material		*		Material		*	
Model		*		Class		*	
Dimensions:				Type		*	
See Attached Drawing for Dimensions				Dimensions:			
				See Attached Drawing for Dimensions			
Max. Operating Temperature (F)		2372		Operating Pressure Differential (ins. W.G.)		+/- 2.5	
Max. Temperature Rating (F)		*		Max. Allowable Leakage Rate (ft. ³ /hr./lin. ft.)		6	
Density (lbs/ft. ³)		*		Max. Operating Temperature (F)		1300	
Tensile Strength (psi)		B		Max. Temperature Rating (F)		*	
Flexural Strength (psi)		B		Density (lbs/ft. ³)		*	
Thermal Resistance (R-value)		*		Tensile Strength (psi)		B	
Number Required		120		Flexural Strength (psi)		B	
Total Shipping Weight (lbs)		*		Thermal Resistance (R-value)		*	
Operating Pressure Differential (ins. W.G.)		+/- 2.5		Number Required		60	
Max. Allowable Leakage Rate (ft. ³ /hr./lin. ft.)		6		Total Shipping Weight (lbs)		0	
Date		10-Feb-05		Date		22-Mar-05	
By		GJ		By		GJ	
Chkd		FS		Chkd		FS	
Rev.		A		Rev.		1	



TECHNICAL DATA SHEETS

Data sheet 2 of 2

Seal Information

Item 5: ICV Box Ventilation Inlet Port Seal

Material	*		
Model	*		
Dimensions:	(in) *		
See Attached Drawing for Dimensions			
Operating Pressure Differential	(ps. W.G.)	+/- 2.5	0
Max. Allowable Leakage Rate	(ft. ³ /hr./lin. ft.)	6	0
Max. Operating Temperature	(F)	1300	
Max. Temperature Rating	(F) *		
Density	(lbs/ft. ³) *		
Tensile Strength	(psi) *		B
Flexural Strength	(psi) *		B
Thermal Resistance	(R-value) *		
Number Required		60	0
Total Shipping Weight	(lbs) *		

Item 6: Level Detection Port Seal

Material	*		
Model	*		
Dimensions:	(in) *		
See Attached Drawing for Dimensions			
Operating Pressure Differential	(ps. W.G.)	+/- 2.5	0
Max. Allowable Leakage Rate	(ft. ³ /hr./lin. ft.)	6	0
Max. Operating Temperature	(F)	1300	
Max. Temperature Rating	(F) *		
Density	(lbs/ft. ³) *		
Tensile Strength	(psi) *		B
Flexural Strength	(psi) *		B
Thermal Resistance	(R-value) *		
Number Required		60	0
Total Shipping Weight	(lbs) *		

Item 7: ICV Box Off-Gas Connection Port

Material	*		
Model	*		
Dimensions:			
See Attached Drawing for Dimensions			
Operating Pressure Differential	(ps. W.G.)	+/- 2.5	0
Max. Allowable Leakage Rate	(ft. ³ /hr./lin. ft.)	6	0
Max. Operating Temperature	(F)	1300	
Max. Temperature Rating	(F) *		
Density	(lbs/ft. ³) *		
Tensile Strength	(psi) *		B
Flexural Strength	(psi) *		B
Thermal Resistance	(R-value) *		
Number Required		60	0
Total Shipping Weight	(lbs) *		

Item 8: Electrode Port Lid Seal

Material:	*		0
Model	*		0
Dimensions:			0
See Attached Drawing for Dimensions			
Operating Pressure Differential	(ps. W.G.)	+/- 2.5	0
Max. Allowable Leakage Rate	(ft. ³ /hr./lin. ft.)	6	0
Max. Operating Temperature	(F)	1300	0
Max. Temperature Rating	(F) *		0
Density	(lbs/ft. ³) *		0
Tensile Strength	(psi) *		0
Flexural Strength	(psi) *		0
Thermal Resistance	(R-value) *		0
Number Required		60	0
Total Shipping Weight	(lbs) *		0

Comments:

- Items marked with an * shall be filled in by VENDOR
- See Drawing F-145579-35-D-0019 (attached)

Date	10-Feb-05	21-Feb-05	21-Mar-05	22-Mar-05			
By	GJ	GJ	GJ	KJ, FORGET			
Chkd	FS	FS	FS	KJ, FORGET			
Rev.	A	B	0	1			



TECHNICAL DATA SHEETS

PROJECT:	Final DBVS Design	145579-D-DS-050.1	REV. 1
PROJECT NO.:	145579	ICV Box Lid Seals	
CLIENT:	AMEC E&E - Richland, Washington	EQ. NO.:	ICV Box Seals

BIDDERS DRAWING AND DATA COMMITMENTS

Vendor shall supply all drawings, manuals and documentation in the quantities indicated. Approval drawings are due within the listed number of calendar days after issue of the Purchase Order or Letter of Intent. The dates set out for drawing and data submissions are governed by the engineering design schedule of the project. The Vendor shall supply one AutoCAD disk file and requested number of copies within the listed number of calendar days. Final drawings must be certified as correct and bear the Vendors name, equipment number and Purchase Order Number. Drawing Transmittals listing the document numbers, revisions numbers, quantities, status and document types must be included with all submissions (including electronic submittals).

SEND ALL DOCUMENTS TO:

Submit all documents via courier service

Faxed documents must be followed by the originals.

Electronic E-mail or FTP transmissions of drawings & data must be copied to Document Control

Always include a transmittal

AMEC Americas Limited
1385 Cedar Avenue
Trail, BC, Canada
V1R 4C3
Attn: Document Control
Phone: (250) 368-2400
Fax: (250) 368-2401

BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS

Proposal	Bidder shall include this data for each item			REVIEW ITEMS DUE WITHIN (DAYS)	VENDOR COMMITMENT (SEE NOTE 4) (DAYS)
	Review	Required before ordering or start of fabrication			
		Final	Required within 7 days prior to shipment and before final payment		
PROPOSAL	REVIEW	FINAL	DESCRIPTION		
1			Q A program that satisfies the requirements of ASME NQA-1-1994	Bid	
			Experience list and maintainability information	N/A	
E+3	E+3		Design, fabrication & delivery schedule	PO+7	
			Outline drawings and layout drawings indicating weights and dimensions	N/A	
			Technical Brochures on Purchased Components	N/A	
			Calculations	N/A	
			Spare parts list	N/A	
			Set of installation and maintenance manuals c/w technical literature for all equipment and devices	N/A	
		1	Hardware Delivery	PO+70	
			Site commissioning record & test results	N/A	

THE TIMELY RECEIPT OF THE VENDOR DOCUMENTS IS CRITICAL TO THIS PROJECT
BUYER COMMITS TO A 10 WORKING DAY TURNAROUND ON REVIEW ITEMS

I agree to provide the listed documentation and data and the dates shown above.

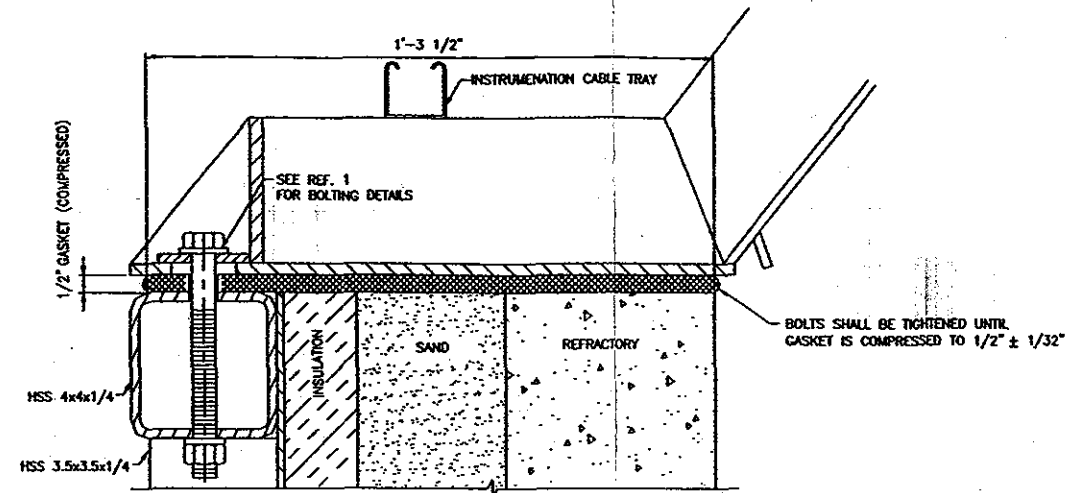
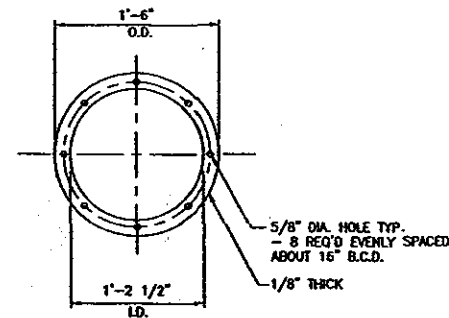
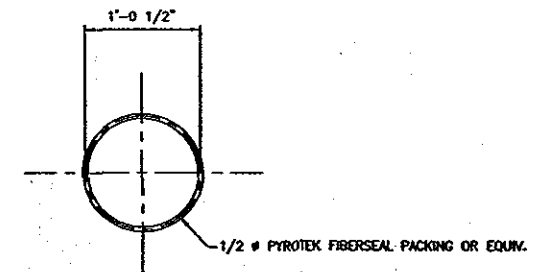
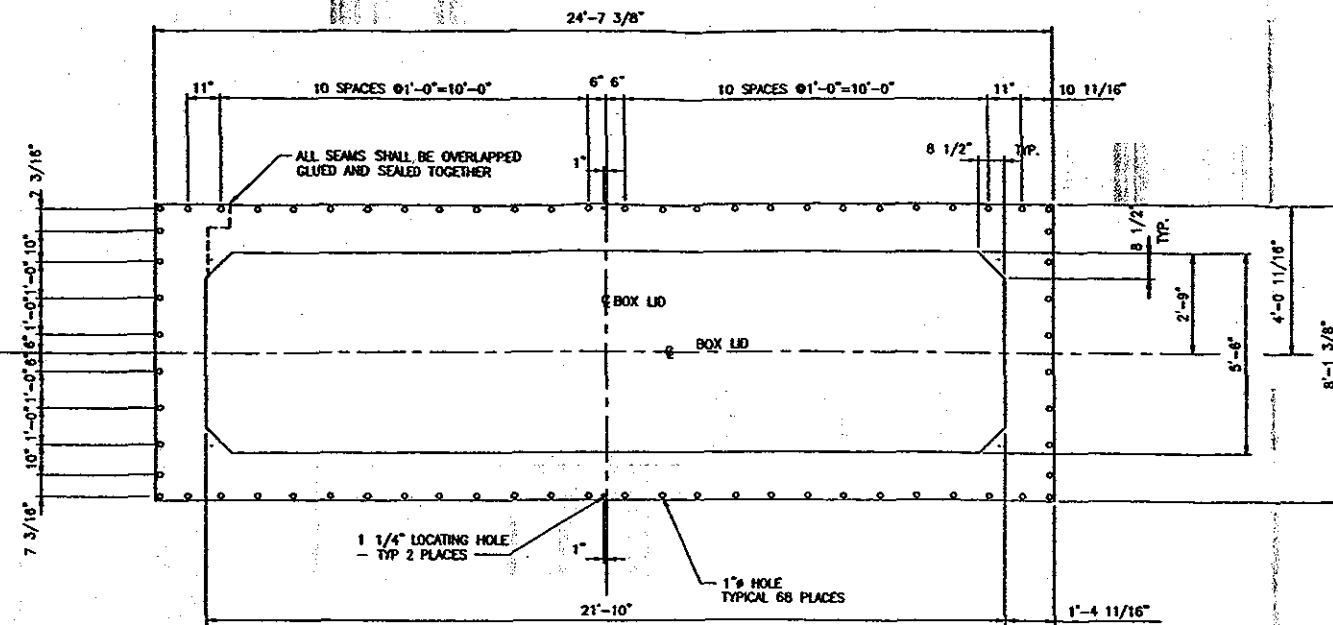
Vendor Signature

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No.	AMEC Dwg. No.	REFERENCE DRAWINGS
1	F-145579-35-D-0004	ICV BOX DATA SHEET
2	F-145579-35-D-0005	ICV BOX LID ASSEMBLY
3	F-145579-35-D-0006	ICV BOX PLAN AND SECTIONS

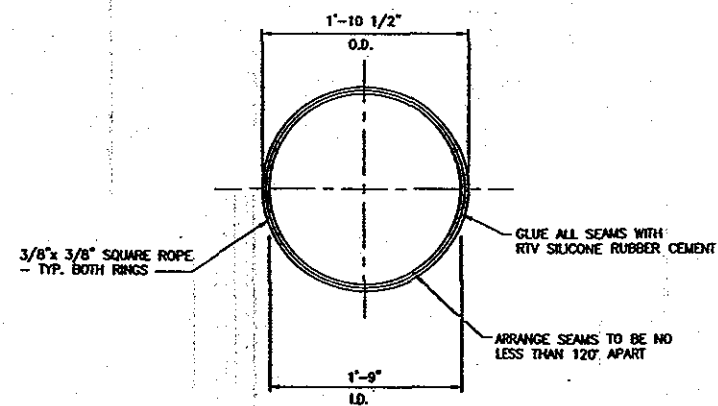
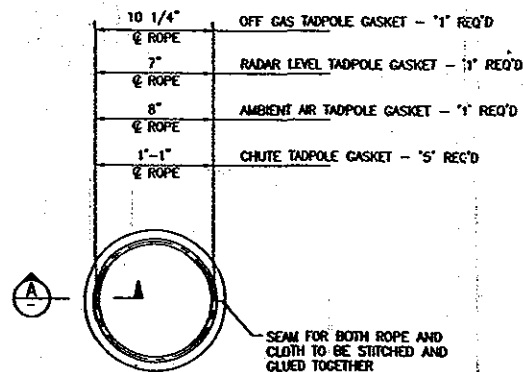
GENERAL NOTES:

1. QUANTITIES MARKED FOR ITEMS REPRESENT TOTAL FOR "1" ICV BOX LID ONLY
2. MATERIALS: AS NOTED

LID TO BOX GASKET CLOSURE DETAIL
SCALE: 6"=1'-0" (1/0004)CERAMIC FACE GASKET - '2' REQ'D
SCALE: 1 1/2"=1'-0"
MAT'L: PYROTEK M8 FABRIC OR EQUIV.
LOCATION: SEE REF. 2CERAMIC SLEEVE PACKING - '2' REQ'D
SCALE: 1 1/2"=1'-0"
MAT'L: PYROTEK A-1 ROPE C/W GRAPHITE COATING OR EQUIV.
LOCATION: SEE REF. 2

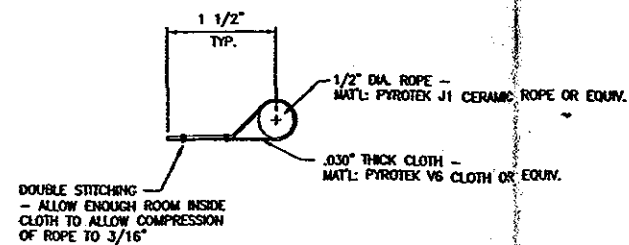
BOX LID GASKET - '1' REQ'D

MAT'L: 1" THICK 8# MA FIBRESEAL BLANKET OR EQUIV.
LOCATION: SEE REF. 2 & 3

ELECTRODE LID GASKET - '2' REQ'D
SCALE: 1 1/2"=1'-0"
MAT'L: C9 CERAMIC FIBER OR EQUAL
LOCATION: SEE REF. 2

TADPOLE GASKETS

SCALE: 1 1/2"=1'-0"
MAT'L: PYROTEK J1 CERAMIC ROPE OR EQUAL
LOCATION: SEE REF. 2

TYPICAL TADPOLE
SECTION (A)
1:1

DWG NO.	TITLE	REF NUMBER	TITLE	REVISIONS
1	DRAWING TRACEABILITY LIST	1	REFERENCES	
2		2		
3		3		
4		4		
5		5		
6		6		
7		7		
8		8		

ISSUED FOR CHEM MILL REVIEW AND BOX REPORT		03 MAR 05	RRD	AA	PES/WH	TH
ISSUED FOR INTERNAL APPROVAL		09 FEB 05	RRD	AA	PES/WH	TH
REVISION DESCRIPTION						
F-145579-35-D-0019						
amec						
145579-FINAL DBVS DESIGN						
U.S. DEPARTMENT OF ENERGY						
Office of River Protection						
BULK VITRIFICATION						
ICV BOX LID						
GASKET DETAILS						
F						
AS NOTED						

145579-D-SP-023

TECHNICAL SPECIFICATION
AMEC Americas Limited


The document revision number is indicated below. Please replace all revised pages of this document and destroy the superseded copies.

PROJECT:	Final DBVS Design	145579-D-SP-023	REV. 1
PROJECT NO:	145579	ICV™ BOX AND LID SPECIFICATION	
CLIENT:	AMEC E&E - Richland, Washington		

REV NO.	ISSUED FOR	ORIGIN	DATE	INITIAL
A	For Internal Review	VL	07-Oct-04	VL
B	Internal Approval	VL	21-Oct-04	VL
C	CH2M Hill Review	VL	02-Nov-04	VL
0	Bid Request	VL	07-Mar-05	VL
1	Design Update	SB	18-Mar-06	SB

DOCUMENT APPROVAL

<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>AMEC Richland</p> <p><i>Original Approvals on File</i></p> <p>Project Manager: <u>J. Scapellato for J. Scapellato</u></p> <p>Date: <u>3-22-06</u></p> <p>Discipline Lead: <u>J.R. Brigg</u> <u>S.R. Brigg</u></p> <p>Date: <u>3/22/06</u></p> <p>QA: <u>Hank M. Chepin</u></p> <p>Date: <u>03-22-06</u></p>
<p>CLIENT APPROVAL (CH2M HILL)</p> <p>Project Manager: <u>J. Van Bock</u></p> <p>Date: <u>3/22/06</u></p>	<p>Originator: <u>J.R. Brigg</u> <u>S.R. Brigg</u></p> <p>Date: <u>3/22/06</u></p>

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AMEC Americas Limited



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PROJECT NO.:	145579	ICV™ BOX AND LID SPECIFICATION	
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APPENDICES

- A TFC-ESHQ-Q_C-C-03 Control of Suspect/Counterfeit Items
 B Carboline® - Thermoline® 4700 Product Data

ATTACHMENTS

145579-D-DS-023.1	ICV Box and Lid Data Sheet
F-145579-35-D-0004	ICV Box Data Sheet
F-145579-35-D-0005	ICV Box Lid Assembly
F-145579-35-D-0006	ICV Box Lid Steelwork – 1 of 3
F-145579-35-D-0007	ICV Box Lid Steelwork – 2 of 3
F-145579-35-D-0008	ICV Box Plans & Sections
F-145579-35-D-0009	ICV Box Lid Details Steelwork – 3 of 3
F-145579-35-D-0011	ICV Box Assembly Details
F-145579-35-D-0018	Assembly Enclosure GA Plans and Elevations
F-145579-35-D-0019	ICV Box Gasket Details
F-145579-35-D-0022	ICV Box Lid Tool and Radar Plate
F-145579-35-D-0024	Bulk Vitrification ICV Box Port Connections
F-145579-00-F-0014	ICV Box Instrument Locations

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Acronym List

°F	Degrees Fahrenheit
µm	Micrometers
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASNT	American Society of Nondestructive Testing
ASTM	American Society of Testing and Materials
AWS	American Welding Society
AWTE	Ancillary Waste Transfer Enclosure
CH2M HILL	CH2M HILL Hanford Group, Inc.
CMTR	Certified Material Test Reports
CWI	Certified Welding Inspector
DBVS	Demonstration Bulk Vitrification System
DOE	Department of Energy
ESD	Electrostatic Discharge
EQL	Enhanced Quality Low Project Risk
ft ³	Cubic Feet
FAT	Factory Acceptance Testing
FCC	Federal Communications Commission
HSS	Hollow Structural Sections
HVAC	Heating, Ventilating, and Air Conditioning
ICV™ ¹	In-Container Vitrification™
lbm	Pounds Mass
NCR	Nonconformance Report
NDE	Nondestructive Examination
NQA	National Quality Assurance
SAE	Society of Automotive Engineers
UBC	Uniform Building Code

¹ ICV™ (In-Container Vitrification™) is a trademark of AMEC Inc.

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1.0 SCOPE

1.1 PURPOSE

AMEC is part of a team that has been selected by the CH2M HILL Hanford Group, Inc. (CH2M HILL) to design, fabricate, test, and deploy a Demonstration Bulk Vitrification System (DBVS) to receive, dry, and immobilize waste from an underground storage tank located in the 200 West Area of the Hanford Nuclear reservation. A main subsystem of the DBVS is the In-Container Vitrification™ (ICV™) Box.

The primary function of the ICV™ Box is to provide a containment unit during the melt process through to burial. The ICV™ Box design is based on a standard waste disposal box that is constructed of steel and is lined with insulation, sand and castable refractory. The box will contain a lid constructed of steel to cover and seal the box and will provide ports for waste feed, electrode positioning, camera movement and Off-Gas exhaust.

Transfer of waste will be accomplished through the use of an Ancillary Waste Transfer Enclosure (AWTE). The AWTE is a vent hood assembly that provides secondary containment of contaminated dust and lowers onto the ICV™ Box. Chutes located in the AWTE are lowered by actuator (gravity down) to seal the port openings. Discharge valves located in the chutes open and close to allow material feed.

Throughout this specification, Contract Responder shall act as the Seller and AMEC shall act as the Buyer.

Any discrepancies noted in this specification or between this specification and other documentation shall be noted and referred to the Buyer for resolution before proceeding with design or fabrication of the item in question.

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1.2 SCOPE OF SUPPLY

1.2.1 Work Included in Scope

The Seller's Scope of Supply shall include, but not be limited to, the supply of materials, fabrication, inspection, testing, documentation, packaging, and shipping of the steel fabricated container tanks and lids, for the ICV™ Box, in accordance with Buyer's Drawings and Datasheets.

Design, fabrication and supply of a spreader bar or bail for use in lifting the empty ICV™ Box and Lid.

Quantity of Box assemblies and hoists rings shall be specified in the purchase order.

1.2.2 Work NOT Included in Scope

The following items of work associated with the specified equipment is NOT in the Seller's scope of supply:

- (a) Supply and installation of insulation board and sand.
- (b) Fabrication and installation of refractory panels.
- (c) Supply and installation of heating electrodes.
- (d) Supply and installation of ceramic components.
- (e) Supply and installation of breather filter.
- (f) Supply and installation of CCTV cameras and associated lights.
- (g) Supply and installation of CCTV camera/light view port assemblies.
- (h) Supply and installation wiring and instrumentation.

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2.0 APPLICABLE DOCUMENTS

The following documents, of the exact issue shown, form a part of the basis of design to the extent specified in the application sections of this document. In the event of a conflict between documents referenced herein and the requirements of this specification, the requirements of this specification shall take precedence.

2.1 GOVERNMENT DOCUMENTS

Table 2-1: Government Documents

Document Number	Title
10 CFR 830	Nuclear Safety Management

2.2 NON-GOVERNMENT DOCUMENTS

Table 2-2: Non-Government Documents

Document Number	Title
ASME B16.5	Pipe Flanges and Flanged Fittings
ASME B18.2.1	Square and Hex Bolts and Screws (Inch Series)
ASME B30.20	Standard for Below-The-Hook Lifting Devices
ASME B30.9	Slings
ASME B31.3	Process Piping
ASME NQA-1 (1994)* (See note at end of table)	Quality Assurance Requirements for Nuclear Facility Applications
ASNT SNT-TC-1A	Recommended Practice – Non Destructive Testing
ASTM A105	Standard Specification for Carbon Steel Forgings for Piping Applications
ASTM A193-01	Standard specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A194-01	Standard specification for Carbon and Alloy Nuts for Bolts for High-Pressure and High-Temperature Service
ASTM A354-01	Standard specification for Quenched and Tempered Alloy Steel Bolts, Studs and other Externally Threaded Fasteners
ASTM A36	Standard Specification for Carbon Structural Steel
RPP-8530, Rev. 0	Tank Farm Labeling Standard

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Table 2-2: Non-Government Documents

Document Number	Title
TFC-ESHQ-QC-C-03, Rev. B	Control of Suspect/Counterfeit Items
ASTM A500	Specification for Cold-Formed Welded and Seamless Carbon Structural Tubing in Rounds and Shapes
AWS D1.1	Structural Welding Code – Steel
AWS D1.6	Structural Welding Code – Stainless Steel
AWS QC-1-96	Standard for AWS Certification of Welding Inspectors
SAE J429	Mechanical And Material Requirements for Externally Threaded Fasteners, Standard

*The relevant requirements of NQA-1 are included in Section 4.0.

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3.0 TECHNICAL REQUIREMENTS

The following is a description of the requirements and procedures for fabrication of the ICV™ Box and Lid. The Seller shall provide similar documentation stating the ability of the finished product to comply with the necessary procedures. Any modification by the Seller to ICV™ Box and Lid design shall be supported by design calculations.

3.1 ITEM DEFINITION

The ICV™ Box is designed to receive a waste/soil mixture, contain the Vitrification process and serve as the final disposal container. The box is based on a standard waste disposal container with modifications and designed to be watertight; to withstand the hydraulic loads of the molten glass and the weight of the total contents of insulation, sand refractory and glass.

The ICV™ Box Lid will cover the box and act as a ventilation hood. The lid will be installed during assembly and remains on the box during the Vitrification process and will be disposed of along with the box. The lid will have ports in wells for electrode placement, five ports for material feed, HVAC inlet/outlet, two ports for cameras/camera lights and two sensor ports.

3.1.1 Item Diagram

See Drawings F-145579-35-D-0004, F-145579-35-D-0005, F-145579-35-D-0006, F-145579-35-D-0007, F-145579-35-D-0008, F-145579-35-D-0009, F-145579-35-D-0011, F-145579-35-D-0019, F-145579-35-D-0022, F-145579-35-D-0024 and F-145579-00-F-0014.

3.1.2 Interface Definition

The Box and Lid is to be a watertight seal; bolting pattern will be as referenced in drawing F-145579-35-D-0004.

The Lid will be required to interface the AWTE Hood, which is an onsite structure. Chutes from this hood will be lowered through the ports located on the Lid, which allows feed into the Box. Sealing will be provided on the ports to prevent material backflow. This is an onsite interface and not part of the ICV™ Box scope of supply.

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3.2 CHARACTERISTICS

3.2.1 Functional Characteristics

As specified in the Datasheet, 145579-D-DS-023.1.

The ICV™ Box and Lid must be constructed in such a way that no rainwater can collect on the equipment. Provisions for drainage, including drain holes have been incorporated in the ICV™ Box and Lid design and shown on the attached drawings.

3.2.2 Physical Characteristics

As specified in the Datasheet, 145579-D-DS-023.1 and Drawings: F-145579-35-D-0004, F-145579-35-D-0005, F-145579-35-D-0006, F-145579-35-D-0007, F-145579-35-D-0008, F-145579-35-D-0009, F-145579-35-D-0011, F-145579-35-D-0019, F-145579-35-D-0022, and F-145579-00-F-0014

3.2.3 Reliability

Not applicable to this specification as this requires no action from the Seller.

3.2.4 Maintainability

Not applicable to this specification as this requires no action from the Seller.

3.2.5 Environment

The equipment will be placed in outdoor storage. Equipment and related enclosures installed outside will be designed to operate and be stored in the climatic and environmental conditions listed below.

- (a) Ambient air temperature range is -25°F to 115°F with a maximum 24-hour differential of 50°F;
- (b) Relative humidity ranges from near 0 to 100%;
- (c) Maximum precipitation is 2.5 inches in a 6-hour period;
- (d) Sand and dust concentrations are 1.10×10^{-5} lbm/ft³ with a typical size of 150 μ m;

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3.2.6 Transportability and Storage

The ICV™ Box and Lid shall be transported as one complete unit using local roadways and freeways. Any sealing such as gaskets between the lid and the box will be shipped loose to prevent premature crushing of the gasket. Fasteners for the lid may be either shipped loose and placed inside the box or installed but not tightened. Seller to provide bracing and shipping plan for review and approval by the Buyer.

3.2.7 Safety

The ICV™ Box shall be designed to maintain the safety of operators, general public, and equipment.

3.3 DESIGN AND CONSTRUCTION

3.3.1 Parts/Materials/Processes

Major components of the ICV™ Box shall be fabricated from materials as specified on the Technical Data Sheet, 145579-D-DS-023.1. All parts and materials shall be new. Material type and grade shall be clearly identified on the bill of materials. Certified Material Test Reports (CMTRs) are required for all materials. The Seller shall identify any materials that do not have CMTRs for review, approval, and final records. No aluminum or "yellow" metals are to be used. No beryllium shall be present. No lead is to be used unless encapsulated.

3.3.1.1 Plates

Plate sections shall conform to ASTM A36 *Standard Specification for Carbon Structural Steel* as a minimum.

3.3.1.2 Structural Shapes

Hollow Structural Sections (HSS) shall conform to ASTM A500 *Grade C Specification for Cold-Formed Welded and Seamless Carbon Structural Tubing in Rounds and Shapes*.

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3.3.1.3 Flange Joints/ Ports

The ICV™ Box Sample Port (Flanged connection) is identified on drawing F-145579-35-D-0004. All ICV™ Box Lid ports are identified on drawing F-145579-35-D-0005.

3.3.1.4 Threaded Joints

Threaded joints in lines shall be joined using Loctite®² PST.

3.3.1.5 Mechanical Assembly Requirements

All equipment shall be fabricated and assembled observing the equipment Manufacturer's recommended assembly instructions and the requirements of this specification.

3.3.1.6 Hoisting and Rigging Loads

Hoisting and Rigging shall be in accordance with DOE/RL-92-36 *Hanford Site Hoisting and Rigging Manual*. Slings used in lifting shall be as per ASME B30.9 *Slings*. Equipment purchased by Seller shall have a factor of safety of 3 based on yield strength. Documents shall be provided to the Buyer demonstrating incorporation of these safety factors. The Seller shall identify the total weight and center of gravity for lifting of the ICV™ Box and Lid. Lift points shall be identified with yellow paint.

3.3.1.6.1 Lifting Devices

The spreader bar shall be provided by the Seller and shall be designed in accordance with the ASME B30.20 *Standard Below-the-Hook Lifting Devices*. The equipment must be designed in such a way that is adequate clearance to lift the Lid onto the ICV™ Box while it is positioned on the support rails in the assembly enclosure as shown in drawing F-145579-35-D-0018.

Hoist rings shall be as specified in the Technical datasheet 145579-D-DS-023.1. Operation and inspection will be in accordance with the supplier's standard practice.

² Loctite® is a registered trademark of Henkel Corporation

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3.3.1.7 Fasteners

No fasteners shall be capable of vibrating loose under operating conditions. All such joints should be tack welded or have some equivalent means of assurance of remaining intact. Double-nutting is not an acceptable method of securing fasteners. Loctite® threadlock may be used where applicable.

Bolts cap screws, and washers shall be per ASTM A193 Grade B8 *Standard specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service*. Bolts and cap screws shall be grade marked. Nuts shall be heavy hex nuts per ASTM A194 Grade 8 *Standard specification for Carbon and Alloy Nuts for Bolts for High-Pressure and High-Temperature Service*.

All graded fasteners shall conform to ASME B18.2.1 *Square and Hex Bolts and Screws (Inch Series)*, Society of Automotive Engineers (SAE) J429.

The Seller shall select fasteners where they are not specifically called out in this specification using the following guidance:

- (a) Anti-galling compound (e.g., Loctite® 8013 or 8009) shall be applied where stainless-steel bolts are used.
- (b) The Seller shall ensure that suspect/counterfeit fasteners and components are not used for the construction of the ICV™ Box assembly and its components. Suspect fasteners can be identified by the following inspection methods:
 - (i) Head markings are marred, missing, or appear to have been altered,
 - (ii) Threads show evidence of dressing or wear (threads should be of uniform color and finish),
 - (iii) Head markings are inconsistent with a heat lot, and
 - (iv) Head markings matching one of those identified on the United States Customs Service, "Suspect Headmark List", in Appendix A.

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3.3.1.8 Gaskets

Pipe flange connections shall be appropriate for the temperature, radiation dose and sealing application of the system to which they will be sealing. Where gaskets have not been specified in this document or attached datasheets the Seller shall provide manufacture cut-sheets and application data for gaskets during the design for Buyer approval. All gaskets supplied shall be new while a separate test gaskets shall be used for leak testing.

3.3.1.9 Welding

Certified welders shall perform welding of all structural steel in accordance with American Welding Society (AWS) D1.1 *Structural Welding Code – Steel* or AWS D1.6 *Structural Welding Code – Stainless Steel*, unless specified in the attached datasheets or drawings. Welding Procedures, Procedure Qualification Records, and Welder Procedure Qualification Records shall be submitted for review and approval to the Buyer before welding is performed.

3.3.1.9.1 Allowable Welding Methods

Welding of all carbon steel, including but not limited to structural shapes, rectangular tubing, plate, and sheet shall be performed in accordance with AWS D1.1 nontubular, statically- loaded conditions.

3.3.1.9.2 Welding Procedure Requirements

All welding shall be performed in accordance with the Seller's approved Welding Procedure specification. Each Welding Procedure specification shall be qualified with a Procedure Qualification Record as required in AWS D1.1 and AWS D1.6, as applicable.

3.3.1.9.3 Welder Qualification

Welder Performance Qualification Records shall be submitted for all personnel performing welding, including tacking. Welders shall be qualified in accordance with AWS D1.1 and AWS D1.6, as applicable.

3.3.1.9.4 Weld Joints and Preparation

Weld joints are as permitted by the referenced standards.

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3.3.1.9.5 Weld Repair

Weld defects shall be removed and repaired as allowed by the referenced standards. The original Welding Procedure specification shall be used for weld repair. Welds that fail inspection shall not be ground out and repaired more than twice before the section is abandoned and replaced.

3.3.1.9.6 Inspection

Inspection shall be done in accordance with the Seller's standard practice. A certified dimensional drawing and weldmap shall be produced from this inspection.

Prior to fabrication, a weld map shall be produced and delivered to the Buyer for review and approval. Welds shall be inspected per ASME B31.3, normal service at a minimum for pressure piping and per AWS D1.1 or D1.6 (depending on material) for structural steel. An AWS Certified Weld Inspector (CWI) shall perform visual inspections and inspectors certified to ASNT SNT-TC-1A *Recommended Practice – Non-Destructive Testing*, shall perform NDEs. Visual and NDE weld inspection procedures shall be submitted along with the personnel certifications to the Buyer for review and approval, before performance of the inspections and examinations. Welded connections on the lifting components shall be 100% visual and 100% Dye-Penetrant Test or Magnetic Particle Test inspected.

3.3.2 Industry and Government Standards

The ICV™ Box and Lid shall comply with all applicable industry and government standards called out herein.

3.3.3 Radiation

The ICV™ Box and Lid will be directly exposed to nuclear radiation from the waste to be contained. This exposure must not affect the operation of the equipment.

3.3.4 Cleanliness

Before assembly, and before preparing for shipment, all components shall be cleaned by flushing clean water and/or blown clean and dry with compressed air

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to the extent that extraneous materials, such as those listed below, are not present:

- (a) Metallic or other dusts (shop dust), chips, turnings, and weld splatter;
- (b) Abrasive particles;
- (c) Rust and other loose corrosion particles;
- (d) Magnetic/liquid penetrant residues, dye check, etc.;
- (e) Foreign material, such as paper, tape, plastic, sand, and wood;
- (f) Cutting oils;
- (g) Excess lubrication, grease, and oil; and
- (h) Marking dyes.

The fabrication procedure shall describe the cleaning and packaging steps taken.

The ICV™ Box/Lid ports and pipe openings shall be temporarily capped following cleaning and drying for shipment.

3.3.5 Corrosion of parts

Carbon-steel surfaces shall be protected from corrosion by coating or painting the surfaces as stated in Section 3.3.6.

3.3.6 Protective Coatings

Carbon steel surfaces will require a protective coating as specified as follows:

- The exterior shall be High Temp Carboline®³ - Thermaline™⁴ 4700 (see Appendix B).

3.3.7 Interchangeability

Not applicable to this specification.

3.3.8 Identification and Marking

The ICV™ Box shall have a Manufacturer's nameplate using the Seller's standard practice. The nameplate shall include: the equipment number (provided by the Buyer); assembly weight; purchase order number; lifting bail working load limits;

³ Carboline® is a registered trademark of Carboline Company, St. Louis, Missouri

⁴ Thermaline™ is a trademark of Carbonline Company, St. Louis, Missouri

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Manufacturer data for swivel hoist rings (as applicable); and this specification number, 145579-D-SP-023, latest revision. Clearly mark and identify any components required for removal before equipment installation (e.g., shipping blocks). Care should be taken when painting such that the lifting eyes, or lifting swivel Manufacture nameplates are not painted.

3.3.9 Nameplates

Seller shall provide a nameplate according to section 3.3.8.

3.3.10 Human Engineering

There are no special human engineering requirements for this equipment.

3.3.11 Qualification

Equipment supplied by the Seller shall be subject to Factory Acceptance Testing (FAT). The Seller shall provide a FAT plan for leak testing of the ICV™ Boxes in their proposal in accordance with the verification, inspection and test requirements specified in sections 4.2 and 4.3.

3.3.11.1 Leak Testing

The ICV™ Box and Lid shall be leak tested to verify that the container is watertight. The Lid and Box shall be assembled with a separate test gasket and bolts connecting the lid to box shall be tightened. The test gasket shall be a representative type of the end-use gasket.

3.3.12 Document Submittal

Each document submittal shall be identified with this specification number, item number, purchase order number, and Seller's identification number. Submittals shall be transmitted to the Buyer in accordance with the directions found in the Drawing and Data Commitment sheet in the Technical Data Sheet 145579-D-DS-023.1.

Data shall be sufficiently clear to allow legible copies to be made on standard reproduction equipment after microfilming.

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Along with the bid submittal, the items shown in the Drawing and Data Commitment sheets, shall be included. The schedule shall show equipment fabrication, testing, and delivery as noted on the inquiry. The drawings shall show full compliance with this specification (and the associated drawings/documents) or note any exceptions. The Seller shall allow 10 working days for the Buyer to review and state the disposition of each submittal.

Approval by the Buyer does not relieve the Seller from the responsibility for accuracy or adequacy of design under this specification.

Submittals are divided into two types: (1) Those requiring "approval before proceeding" (i.e., weld procedures or pre-purchase evaluation data); and (2) Those requiring "approval before shipment" (i.e., vendor information data).

Submittals requiring approval before shipment will be reviewed to verify completeness and adequacy for their intended purposes.

Unacceptable items that require approval before proceeding will be handled as specified below.

A submittal requiring approval that is not approved by the Buyer, will be dispositional as:

1. "Not Approved, Revise and Resubmit." The submittal is considered technically deficient, or incomplete, and is therefore unacceptable. Re-submittal is required; hence fabrication, procurement, or performance of procedures shall not proceed.
2. "Approved with Exception." Fabrication, procurement, and performance of procedures may proceed, and re-submittal is required to verify incorporation of the exception. Final acceptance of the item is contingent upon the Buyer's receipt and approval of the corrected submittal.

Submittals requiring approval before shipment that are determined to be incomplete or inadequate will be marked "Resubmit" and will be returned. An explanation of the deficiencies will be included for corrective action by the Seller.

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The Seller shall provide fabrication traveler(s) for the fabrication and testing of the above-described equipment. The fabrication traveler(s) shall include detailed procurement, fabrication, assembly, testing, shipping, and handling steps required to properly fabricate, assemble, and test the equipment in accordance with the drawings and specifications.

A proposed schedule of fabrication, inspection, and testing of all equipment shall be submitted for review with the bid and approval with the submittal of the fabrication traveler(s).

The Buyer will insert witness/hold points in the fabrication traveler during their review and approval of the fabrication traveler. Witness points can be waived by the Buyer but must be document in writing. Hold points require the Buyer personnel to be present during the fabrication, inspection, or test step.

3.3.13 Personnel and Training

Records for the following areas shall be prepared and made available for the Buyer. Review of the qualifications may be subject to a surveillance or source inspection by the Buyer.

3.3.13.1 Welder Qualifications

Welding personnel shall be qualified in accordance with AWS.D1.1. The welder qualifications shall be submitted and approved by the Buyer before performing any welding.

3.3.13.2 Inspector Qualifications

Weld inspections shall be performed by an AWS-Certified Weld Inspector in conformance with provisions of AWS QC-1-96 *Standard Certification of Welding Inspectors* and shall perform visual inspections, and examiners certified to ASNT SNT-TC-1A shall perform all other nondestructive examinations (NDE). The inspector qualifications and the inspection procedures, including the visual examination procedure, shall be submitted and approved by the Buyer before performing any welding.

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3.3.13.3 Welding Procedure Qualifications

Welding procedures qualifications shall be submitted and approved by the Buyer before welding is performed.

4.0 QUALITY ASSURANCE REQUIREMENTS
4.1 GENERAL
4.1.1 Quality Assurance Program

The Subcontractor/Supplier shall have a documented, implemented and maintained Quality Assurance Program that is based on a national standard and identifies the activities and items to which it applies. Instructions and procedures must include or reference appropriate quantitative or qualitative acceptance criteria for determining that prescribed activities have been satisfactorily accomplished. The Quality Assurance Program must address each of the areas discussed within this QA Requirements Flow-down. The Subcontractor/Supplier must submit the Quality Assurance Program to the Buyer for review prior to award of contract.

The Subcontractor/Supplier shall assess its Quality Assurance Program regularly to assure its effective implementation.

The Quality Assurance Program shall provide for indoctrination and training, as necessary, of personnel performing activities affecting quality to assure that suitable proficiency is achieved and maintained. Personnel who conduct inspection and test activities shall be qualified to conduct those activities and certification of the qualification must be submitted to the Buyer upon request.

4.1.2 Design

The Subcontractor/Supplier must define, control, and verify designs developed for this contract. Design inputs must be specified on a timely basis and correctly translated into design documents. Design interfaces must be identified and controlled. Persons who did not design the item must be used to verify design adequacy. Design changes, including field changes, must be reviewed and approved by the same personnel who reviewed and approved the initial designs.

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4.1.3 Procurement Document Control

Procurement documents must include or reference sufficient quality and technical requirements in order to describe the items and services requested. Procurement documents must be reviewed and approved by the authorized personnel within the Subcontractor's/Supplier's organization, and changes must be reviewed and approved by the same individuals who reviewed and approved the original procurement documents.

The Subcontractor/Supplier must have a process for accepting procured items. This process must include one or a combination of the following: Certificate of Conformance, source verification, receiving inspection, and post-installation testing.

The Subcontractor/Supplier shall provide a legible and reproducible Certificate of Conformance. The Certificate of Conformance shall be signed by the Subcontractor's/Supplier's authorized representative responsible for quality assurance.

The Certificate of Conformance shall contain, as a minimum, the following information:

- Identification of the Buyer's contract or purchase order number under which the materials, equipment, component, or service is being purchased;
- Provide traceability by means of positive identification from the material, equipment, component, or service to the Certificate of Conformance;
- Identify the specific procurement requirements met by the material, equipment, component, or service supplied (i.e., codes, standards, or other applicable specification). The procurement requirements shall include any approved changes, waivers, or deviations applicable to the subject materials, equipment, component, or service;
- Identify any procurement requirements that have not been met, together with an explanation and the means for resolving the nonconformance.

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The Subcontractor's/Supplier's certification system, including the procedures to be followed in filling out a certificate and the administrative procedures for review and approval of the certificates, shall be described in the Subcontractor's/Supplier's QA Program.

The certification system shall provide a means to verify the validity of Subcontractor/Supplier certificates and the effectiveness of the certification system, such as during the performance of audits of the Subcontractor/Supplier or independent inspection or test of the items. The Buyer shall conduct this verification at intervals commensurate with the Subcontractor's/Supplier's past quality performance.

The Subcontractor/Supplier is required to flow-down all quality assurance requirements from this contract to any sub-tier suppliers/Subcontractor/Suppliers. Any access to the sub-tier suppliers'/Subcontractor/Suppliers' facilities for verification activities will be requested through the Subcontractor/Supplier prior to access, and verification activities may be performed jointly.

The Subcontractor/Supplier shall warrant that all items furnished under the contract are genuine (i.e., new, not refurbished, not counterfeit) and match the quality, test reports, markings, and/or fitness for intended use as required by the contract. Any materials furnished as part of the contract that the government or other duly recognized agency had been previously found to be suspect/counterfeit shall not be used.

All items are subject to inspection at the Subcontractor's/Supplier's facility or lower-tier subcontractor's facility. The Subcontractor/Supplier shall notify the Buyer at least 7 working days in advance of the time when such items or activities will reach the Buyer's identified inspection hold points. As a minimum, final inspection prior to packaging for shipment shall be considered such a hold point, unless specifically waived by the Buyer.

The Subcontractor/Supplier shall obtain all materials to be delivered under the contract directly from the original manufacturer or an authorized manufacturer's representative. The Subcontractor/Supplier shall provide legible and reproducible documentation, with the materials, that provides objective evidence that the items were provided by the original manufacturer. Such documentation may include a

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copy of the purchase order to the manufacturer, shipping documentation or manufacturer invoice; each of which would identify that the materials were obtained from the original manufacturer.

The Subcontractor/Supplier shall submit, with or prior to item shipment, a recommended spare parts list. The list shall provide the name and address of the original supplier of the replacement part, and the part's drawings, specification, or catalog identity including applicable change or revision information.

All items and/or services procured under this specification shall be subject to inspection by the Buyer or Buyer's representative throughout the contract. Additionally, procured items and/or services shall be subject to inspection for acceptance.

The Subcontractor/Supplier shall grant access to the Subcontractor's/Supplier's plant facilities and records for inspection or audit by the Buyer, his designated representative, and/or other parties authorized by the Buyer.

4.1.4 Identification and Control of Items

The Subcontractor/Supplier shall establish controls to assure that only correct and accepted items are used or installed.

All items shall be identified with the applicable part number, model number, or other identifier prescribed in the specification. Identification shall be on the item or the package containing the item. When the identification is on the item, such marking shall not impair the service of the item or violate dimensional, chemical, or physical requirements.

The Subcontractor/Supplier shall submit a legible and reproducible copy of the product data sheet (e.g., drawing, catalog cut sheet, brochure, etc.) that provides adequate information to enable the Buyer to verify the form and function of the articles procured. One copy of such documentation, unless otherwise specified, shall accompany the item.

The Subcontractor/Supplier shall identify each item, assembly, package, container, or material, having limited shelf life, with the cure date or date of manufacture and the expiration date. The Subcontractor/Supplier shall specify

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any storage temperatures, humidity and environmental conditions that should be maintained. Material shall not be furnished having less than 75 percent of total shelf life available at time of shipment.

Certified Material Test Reports (CMTRs) containing actual chemical analysis and mechanical properties of the material being supplied shall be submitted prior to or with each shipment of material. Each CMTR shall contain the following information as a minimum:

- Product Description – specification(s), codes, type of material, etc.;
- Actual results of chemical analysis/mechanical testing in accordance with the provisions of the code, standard, and/or specification;
- The specification and material grade;
- Traceability to the item tested (e.g., heat number, lot number, etc.);
- Name and address of manufacturer (may be identified by letterhead, logo, etc.);
- Manufacturer's ASME certificate number and expiration date;
- Buyer's contract number and item number to which the report applies;
- The report shall be signed by an authorized representative of the manufacturer.

4.1.5 Control of Processes

The Subcontractor/Supplier shall have processes to control processes, including special processes that control or verify quality (e.g., welding, heat treating, and nondestructive examination). Special processes must be performed by qualified personnel using qualified procedures in accordance with specified requirements.

Subcontractor/Supplier personnel performing weld inspections shall be certified as a CWI in accordance with the requirements of the American Welding Society (AWS), QC-1. The following documentation shall be submitted for Buyer approval prior to the start of fabrication:

- Current AWS CWI certification;
- Current/valid visual acuity examination (must be given every 3 years); and
- Visual weld inspection procedure(s).

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Welding procedures and personnel shall be qualified in accordance with applicable AWS or ASME requirements specified in the contract. The Subcontractor/Supplier shall submit copies of all welding procedures, procedure qualification records, and welder qualification records to be employed. Buyer review and approval of these documents is required prior to start of fabrication.

Nondestructive Examination (NDE) personnel shall be qualified and certified in accordance with the recommended guidelines of the American Society of Nondestructive Testing (ASNT) SNT-TC-1A. The Supplier is not authorized to begin fabrication until the following documentation has been approved by the Buyer:

- NDE personnel qualification and certification procedure;
- Level I, II, and/or III personnel qualification and certification records, including objective evidence of NDE training, formal education, examination, experience, date of hire and current visual acuity exam;
- NDE method procedure(s) compliant with the applicable requirements of the Buyer's contract.

NDE reports and radiographs shall be traceable to the item examined, shall include all essential examination parameters, and shall be signed and dated by a qualified/certified NDE examiner. All NDE reports and radiographs shall accompany or precede shipment of the item or component. Radiographs and radiographic technique and examination reports shall be subject to approval by the Buyer prior to shipment.

These requirements shall be passed to lower-tier subcontractors.

4.1.6 Inspection

The Subcontractor/Supplier shall have a process to plan and execute inspections to verify conformance of an item or activity to specified requirements. The process shall document the characteristics to be inspected and inspection methods to be employed. The Subcontractor/Supplier shall document the results of inspections. Inspections for acceptance shall be performed by persons other than those who performed or directly supervised the work being inspected.

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The Subcontractor/Supplier shall submit, as required by the contract, legible, reproducible copies of inspection and/or test reports. The reports shall include, as a minimum, the following information:

- Identification of applicable inspection and/or test procedure;
- Resulting data for all characteristics evaluated, as required by inspection or test procedures, including reference to information on action taken in connection with nonconformances;
- Traceability to the item inspected/tested (e.g., serial number, part number, lot number, etc.), date of inspection, name of inspector, type of observation; and
- Signature of the Subcontractor/Supplier's authorized representative or agency performing the inspection or test.

4.1.7 Test Control

The Subcontractor/Supplier shall have a process to plan and execute tests to verify conformance of an item or activity to specified requirements. The process shall document the characteristics to be tested and test methods to be employed.

The Subcontractor/Supplier shall prepare a detailed test plan. Prior to starting work, the plan shall be submitted to the Buyer for approval and insertion of Buyer's designated source inspection/witness notification points. The test plan shall provide the following at a minimum:

- Traceability to Buyer's purchase/contract order document number;
- Name or description of the item to be tested (e.g., components, assemblies, subassemblies); and
- Method/procedure to be used during test.

Subsequent revisions/modifications to the test plan require review and approval by the Buyer prior to implementation of the changes.

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The Subcontractor/Supplier shall provide test reports that include, as a minimum:

- Item tested,
- Date of test,
- Tester or data recorder,
- Type of observation,
- Results and acceptability,
- Action taken in connection with any deviations noted, and
- Person evaluating test results.

Test plans and test reports must be submitted to the Buyer for the project records.

4.1.8 Control of Nonconforming Items

The Subcontractor/Supplier must have a process to control items that do not conform to specified requirements to prevent inadvertent installation or use. These controls must provide for identification, documentation, evaluation, segregation (when practical), and disposition of nonconforming items, and for notification to affected organizations.

All nonconforming conditions identified at the Subcontractor/Supplier's facility, with a proposed disposition of "Accept-as-Is" or "Repair," as defined below, shall be approved by the Buyer before Supplier implementation of the Nonconformance Report (NCR) disposition:

- **Accept-as-Is:** Nonconforming materials will perform its intended function.
- **Repair:** Nonconforming item can be corrected so that its characteristics meet requirements of the contract.

Nonconforming items identified as "Repair" or "Rework" shall be re-examined in accordance with applicable procedures and with the original acceptance criteria, unless the nonconforming item disposition has established alternate acceptance criteria.

Nonconformances shall be documented by the Subcontractor/Supplier on their own nonconformance form or one provided by the Buyer. After documenting the

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nonconformance and providing a proposed disposition and technical justification, the report shall be submitted to the Buyer.

After the proposed disposition has been evaluated, and approved or rejected by the Buyer, the form shall be returned to the Subcontractor/Supplier. Corrective action may only take place after Buyer approval. Copies of completed, Buyer approved, NCRs shall be shipped to the Buyer with the affected item.

4.2 QUALIFICATION VERIFICATION

Items to be verified:

- Material Certificates
- Leak Tests

4.3 INSPECTIONS AND TESTS

Seller shall provide all necessary reviews, inspections, tests, analyses, demonstrations, and documentation required to verify that all qualifications have been satisfied, including:

- (a) Testing to ensure satisfaction of the specified functional characteristics, as specified in 3.3.11, including leak testing.
- (b) Measurement of the specified physical characteristics.
- (c) Examination for workmanship.

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5.0 PREPARATION FOR DELIVERY
5.1 GENERAL

The equipment shall be shipped as a complete unit. All parts shall be match marked and shown on the general assembly drawings.

5.2 PRESERVATION AND PACKAGING

Seller shall provide all necessary packaging, supports, cushioning, and wrapping to protect the ICV™ Box from damage during shipping.

5.3 PACKING

The ICV™ Box shall be packed appropriately to protect the exterior surfaces during shipping and handling.

5.4 MARKING

All shipping containers shall be marked and labeled for safety, protection, and identification. If the unit must be disassembled for shipping, containers shall be identified as to their contents.

5.5 HANDLING

The seller shall identify any special handling requirements for the ICV™ Box, such as loading and unloading limitations, and restrictions regarding hooks, bails, forklifts, etc.

5.6 SHIPPING

Seller shall specify limitations or special instructions on shipping.

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6.0 NOTES

There are no notes for this specification.

7.0 APPENDICES

Appendix	Description
A	TFC-ESHQ-Q_C-C-03 Control of Suspect/Counterfeit Items
B	Carboline® - Thermoline® 4700 Product Data

8.0 ATTACHMENTS

Document No.	Description	Revision No.
145579-D-DS-023.1	ICV Box and Lid Data Sheet	0
F-145579-35-D-0004	ICV Box Data Sheet	4
F-145579-35-D-0005	ICV Box Lid Assembly	2
F-145579-35-D-0006	ICV Box Lid Steelwork – 1 of 3	2
F-145579-35-D-0007	ICV Box Lid Steelwork – 2 of 3	1
F-145579-35-D-0008	ICV Box Plans & Sections	1
F-145579-35-D-0009	ICV Box Lid Details Steelwork – 3 of 3	1
F-145579-35-D-0011	ICV Box Assembly Details	2
F-145579-35-D-0018	Assembly Enclosure GA Plans and Elevations	1
F-145579-35-D-0019	ICV Box Gasket Details	2
F-145579-35-D-0022	ICV Box Lid Tool and Radar Plate	1
F-145579-35-D-0024	Bulk Vitrification ICV Box Port Connections	A
F-145579-00-F-0014	ICV Box Instrument Locations	0

**TECHNICAL SPECIFICATION**

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APPENDIX A**TFC-ESHQ-Q_C-C-03, REV. B
CONTROL OF SUSPECT COUNTERFEIT ITEMS**

USQ #03-1456-S		
CH2M HILL Hanford Group, Inc.	Manual	ESHQ
	Document	TFC-ESHQ-Q_C-C-03, REV B
CONTROL OF SUSPECT/ COUNTERFEIT ITEMS	Page	1 of 52
	Issue Date	December 31, 2003
	Effective Date	December 31, 2003
APPROVAL AUTHORITY:	R. L. Higgins	
DOCUMENT OWNER:	J. L. Logston	

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1.0 PURPOSE AND SCOPE

(7.1.1, 7.1.2, 7.1.3, 7.1.4)

This procedure describes the process for the identification, prevention, evaluation, notification, and disposition of suspect/counterfeit items (S/CIs) at CH2M HILL. This procedure applies to items that are:

- In the procurement cycle
- In source or receiving inspection
- In inventory at warehouses and staging areas
- Installed
- In operation.

This procedure applies to:

- Company ordered material
- Material supplied by subcontractors
- Material and test equipment supplied by test sponsors
- Construction
- Fabrication shops
- Laboratory work and experiments
- Surplus/excess property
- Government property
- Material obtained from U.S. Department of Energy (DOE) sources.

2.0 IMPLEMENTATION

This procedure is effective on the date shown in the header.

3.0 RESPONSIBILITIES

3.1 Procurement Personnel

Maintain awareness of S/CI and support S/CI program implementation.

3.2 Inspection Personnel

Perform inspections for conformance or acceptance of material including verifications that the item(s) being inspected do not exhibit indications attributed to potential suspect/counterfeit items.

3.3 Quality Assurance Engineer

1. Ensures appropriate procurement controls are implemented to preclude entry of S/CI to the site through review of procurement documents.
2. Notifies the S/CI coordinator of nonconformance reports (NCRs) associated with S/CI.

3.4 S/CI Coordinator

Apprises company, DOE, and DOE local Office of the Inspector General personnel of S/CI status and final disposition.

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Quality Assurance Engineer 4. Review procurement documents to ensure they contain the appropriate procurement controls to preclude entry of S/CI to the site.

Procurement Personnel 5. Ensure vendor selection complies with qualification requirements for the quality level of the items and services and is based on the vendor's ability to demonstrate the capability of delivering acceptable items.

4.3 Inspection for Potential S/CI

Bill of Material Preparers 1. For quality level 0 and P-Card items listed in Attachment B, designate an S/CI inspection in the special instruction of the Bill of Material (BOM) in accordance with the requirements of TFC-BSM-FPM MC-C-01.

2. Ensure quality level 0 and P-Card items are inspected prior to material issuance.

First Line Manager 3. Obtain on-site S/CI inspection for quality level 0 and P-Card items prior to material issue and use.

Engineering Personnel 4. Provide technical specifications, critical characteristics, and acceptance methods to facilitate inspection planning for S/CI prevention and detection.

Quality Assurance Engineer 5. Ensure S/CI detection criteria is incorporated into QA inspection planning activities.

Assigned Inspection Personnel 6. Use Attachments G, H, and I as resources for detecting S/CIs during walkdowns and inspections. Specific items are subject to inspection.

7. Verify and document that the items being inspected do not exhibit indications attributed to potential S/CIs as described in Attachments G through J.

8. If an S/CI is detected during inspection activities, document and control the S/CI in accordance with TFC-ESHQ-Q ADM-C-02.

4.4 Control of Material Identified as S/CI

Responsible Manager or Delegate 1. Ensure items identified as potential S/CI are documented as nonconforming and controlled in accordance with TFC-ESHQ-Q ADM-C-02. Non conformances identified as S/CI shall be reviewed and processed within four working days to determine whether or not the items are S/CI.

2. Transfer tagged S/CIs to 2101-HV for storage.

Cognizant Quality Engineer 3. Notify the S/CI coordinator of all NCRs associated with the S/CI.

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Engineering
Personnel

3. Evaluate S/CI to determine if its use could create a safety hazard in its current/proposed application.

Assigned Company
Personnel

4. If the engineering evaluation of the S/CI has determined that its use could not create a safety hazard in its current/proposed application:

- a. Disposition the S/CI to remain in place.

NOTE: Criteria for dispositioning S/CI is by acceptance, removal, or replacement after an engineering evaluation. This should be based on the deficient characteristic of the particular item.

- b. Identify the accepted S/CI by marking with orange paint or other appropriate methods and note its location.

- c. In areas where operating temperatures are 500°F and above or are subject to cyclic loading where fatigue failure is likely to occur, replace all grades 8 and 8.2 S/CI fasteners prior to further use of the equipment.

- d. Engineering must also identify a way to prevent its reuse in an application it may not be suitable for.

- e. If removed, prepare the S/CI for disposal.

5. If the engineering evaluation of the S/CI has determined that its use could create a safety hazard in its current/ proposed application:

- a. Contact Waste Feed Operations (WFO) Shift Operations to secure the equipment.

- b. Remove the S/CI as soon as practical.

- c. Tag, segregate, or otherwise control the S/CI to prevent inadvertent use.

- d. Prepare the S/CI for disposal.

S/CI Coordinator

6. Ensure that all S/CI material dispositioned for disposal is properly controlled and arranged for the material to be permanently and irrevocably altered so that it cannot be used. Examples of alterations include:

- Melting
- Shredding
- Destroying the threads on fasteners.

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5.0 DEFINITIONS

Counterfeit part. A part made or altered so as to imitate or resemble an "approved part" without authority or right, and with the intent to mislead or defraud by passing the imitation as original or genuine. (Source: U. S. Department of Transportation Federal Aviation Administration Advisory Circular 21-29B, Detecting and Reporting Suspected Unapproved Parts).

Fastener (regardless of the safety classification). (Source: Fastener Quality Act, Public Law 101-592 as amended by Public Law 104-113).

- A screw, nut, bolt, or stud with internal or external threads or a load-indicating washer with a nominal diameter of 5 millimeters or greater in the case of such items described in metric terms; or 1/4 inch or greater in the case of such items in terms of the English system of measurement which contains any quantity of metal and held out as meeting a standard or specification which requires through-hardening; or
- A screw, nut, bolt, or stud having internal or external threads which bears a grade identification marking required by a standard or specification; or
- A washer to the extent that it is subject to a standard or specification applicable to a screw, nut, bolt, or studs described above, except that such term does not include any screw, nut, bolt, or stud that is produced and marked as American Society for Testing and Materials (ASTM) A 307 Grade A or produced in accordance with ASTM F432.

Grade identification. Any symbol appearing on a fastener purporting to indicate that the fastener's base material, strength properties, or performance capabilities conform to a specific standard of a consensus standards organization or government agency.

Graded classifications. System used to determine minimum requirements for structures, systems and components (e.g., design, operation, procurement, and maintenance requirements). The graded classifications in order of precedence are safety class, safety significant, and enhanced quality general services.

High strength graded fastener. Fasteners having a minimum tensile strength of 75 ksi, including those produced and procured in accordance with the Society of Automotive Engineers Standard J429, Grades 5, 5.2, 8, and 8.2; ASTM Standard A325, Types 1, 2, and 3; ASTM A490, ASTM A354, ASTM A449 (I&II), and some ASTM F468.

Item. An all-inclusive term used in place of any of the following: appurtenance, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, or unit. (Source: ASME-NQA-1-1989, Quality Assurance Requirements for Nuclear Facilities).

An all-inclusive term used in place of any of the following: appurtenance, facility, sample, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, unit, documented concept, or data. (Source: DOE G 440.1-6, Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10 CFR 830.120; and DOE 5700.6C, Quality Assurance).

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2. DOE G 440.1-6, "Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1, Worker Protection Management; 10CFR830.120; and DOE5700.6C, Quality Assurance."
3. NRC Information Notice 89-70: "Possible Indications of Misrepresented Vendor Products."
4. NRC Information Notice 89-70, Supplement 1: "Possible Indications of Misrepresented Vendor Products."
5. TFC-BSM-CP CPR-C-01, "Purchasing Card (P-Card)."
6. TFC-BSM-CP CPR-C-03, "Buyer's Technical Representative Process."
7. TFC-BSM-CP CPR-C-06, "Procurement of Items (Materials)."
8. TFC-BSM-CP CPR-C-09, "Supply Chain Process."
9. TFC-BSM-CP CPR-C-11, "Acquisition Planning."
10. TFC-BSM-FPM MC-C-01, "Material Receipt, Storage, Issuance, Return, and Excess Control."
11. TFC-ESHQ-Q ADM-C-02, "Nonconforming Item Reporting and Control."
12. TFC-OPS-OPER-C-24, "Occurrence Reporting and Processing of Operations Information."
13. TFC-PLN-03, "Engineering Program Management Plan."

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ATTACHMENT A - SUSPECT COMPONENTS LIST

This list was extracted from the U.S. Department of Energy Quarterly Reports on the "Analysis and Trending of Suspect/Counterfeit Items at Department of Energy Facilities," July 1997.

NOTE: It is not necessarily a negative reflection on a supplier or manufacturer if S/CIs are reported regarding its particular product. Reputable manufacturers and suppliers have a vital interest in preventing the manufacture or distribution of S/CI associated with themselves. It may be that the supplier or manufacturer was victimized and is pursuing S/CI associated with its products in an aggressive, prudent, and professional manner in order to get such items off the market. Therefore, each particular case regarding the manufacture or supply of S/CI must be examined on its own merit without making premature conclusions regarding fault or culpability of the manufacturer or supplier whose name is associated with the S/CI. In short, what follows is a "suspect components list" and not a "suspect manufacturer or supplier list." The manufacturer or supplier identified in the following table should not be considered to have engaged in any wrongdoing without additional information.

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (Component Examples)			
	<ul style="list-style-type: none"> • TF136090 • TF361050WL • TED1130020 			
	• Not Provided	Commercial Grade	Westinghouse Electric Supply Co. (WESCO)	NRC I.N. 91-48
	• DB-25 & DS-416	Low Voltage	Satin America & Circuit Breaker Systems, Inc.	NRC I.N. 89-45 & Supplement #2
	<ul style="list-style-type: none"> • FSN-5925-628-0641 • DB-25 • DB-50 • HKB3150T • FB3020 • FB3070 • FB3050 • EHB3025 • LBB3125 • HKA31250 • JA3200 • EHB2100 • 225N 	Trip units; Navy Trip units; 1, 2, & 3 pole various amp. ratings	General Circuit Breaker & Electrical Supply	NRC I.N. 88-46, Supplements and Attachments
	<ul style="list-style-type: none"> • EB 1020 • HDEA 2030 • MCP331100R • MCP431550CR • BAB3060H • 656D14 8G03 • FA-2100 • EH-2050 • HFB-3050 • HFD(B)-3020 • MA3600 • F2020 • EH2100 • EB3050 • HMC3800F • EA2090 • FA3125 • HMCP 150 		HLC Electrical Supply	Office Of Nuclear Safety 93-9
			California Breakers, Inc.	
			PENCON International (DBA) General Magnetics/Electric Wholesale	
			ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	
			Molded Case Circuit Breakers	
			NSSS, Inc.	
			Spectrum, Tech.	
			Rosen Electric	
			Luckow Circuit Breaker	

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Westinghouse (cont.) (Component Examples)			
	<ul style="list-style-type: none"> HLB3200T 262156G19 1A & 1B HL300T HLA2400TM HMA3600T HMA3700T HKA3225T HNB2700T 	225 amp, 3 pole 3 pole, 20 amp 3 pole, 30 amp 1 pole, 20 & 30 amp 2 pole, 20 & 30 amp 3 pole, 60 amp	Not Provided	NRC I.N. 88-46 Supp. & Attach. SENS ID #10 3-17-89 SENS ID #11 3-3-89
	<ul style="list-style-type: none"> MDL#KAF QNB3020 QNB3030 BA 	3 pole, 20 amp	Not Provided	
	<ul style="list-style-type: none"> BA BA E3060 F3020 			SENS Report ID #12 10-19-88 NRC I.N. 88-46
Circuit Breakers	ITE (Component Examples)			
	<ul style="list-style-type: none"> Model - E43B015 	3-phase 480 volt	Cal. Breakers/Elect. Wholesale Supply Co.	SENS Report ID #8, 5-5-89
	<ul style="list-style-type: none"> EQ-B 	1 pole, 20 amp 3 pole, 30 amp	Not Provided	SENS ID #10 3-17-89
	<ul style="list-style-type: none"> EE-3B030 			SENS ID #11 3-3-89
	<ul style="list-style-type: none"> EF3B070 EF3H050 EF3B125 EF3B040 E42B020 QJ2B200 JL3B400 	2 & 3 pole various amperages	General Circuit Breaker & Electrical Supply HLC Electrical Supply	NRC I.N. 88-46, Supplements and Attachments

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Square "D" Co. Component Examples (cont.)		ANTI THEFT Systems Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	
	• QOB220	1 pole, 15 amp	Not Provided	SENS ID #10 3-17-89
	• QO220 • LO-3	2 & 3 pole 20 & 50 amp breakers	General Circuit Breaker & Electrical Supply	NRC I.N. 89-45 & Supplement #2
	• SBW-12 • 989316 • FAL3650-16M or • FAL36050-16M • KA36200	3 pole - 200 amp breaker 30A/600V	HLC Electric Supply California Breakers, Inc.	
	• 999330	Not Provided	PENCON International (DBA) General Magnetics/Electric Wholesale	
Circuit Breakers	Manufacturer not Provided	Not Provided	Stokely Enterprises	DOE Letter 8-26-91 Reprinted NuVEP: Bulletin 7-26-91
	• EHB3025		Molded Case Circuit Breakers	
Circuit Breakers	Fed. Pacific (Component Examples)		General Circuit Breaker & Electrical Supply	
	• NEF431020R • NE111020 • NE	3 pole, 20 amp 1 pole, 20 amp 1 pole, 15 amp	HLC Electric Supply	
			California Breakers, Inc.	
			PENCON International (DBA) General Magnetics/Electric Wholesale	SENS ID. #10. 3-17-89

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Circuit Breakers	Manufacturer Not Provided (Component Examples) 50DHP250	2 pole - 50 amp	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46, Supp. & Attach.
Circuit Breakers Heaters	Cutler Hammer (Component Examples) • 10177H13 • 10177H21 • 10177H32 • 10177H036 • 10177H1049	Not Provided	AAKER General Circuit Breaker & Electrical Supply HLC Electrical Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46, Supp. & Attach.

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturers/Type	Description	Supplier	References
Relays	Potter & Brumfield (Component Examples)	Not-latching rotary	Stokely Enterprises Spectronics, Inc. Nutherm International The Martin Co.	NRC I.N. 90-57 & Attach.
	MDR-138, 173-1 134-1, 142-1			
	Teledyne	All qualified to MIL-R-28776 and MIL-R-39016	Not Provided	DOE-ID Wilmot letter, 7-16-91
	G.E. & Exide (Component Examples)	Overload & Aux.	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-46, Supp. & Attach.
	• 12HGA-11S52 • NX 400			
	Manufacturer not provided	Not Provided	Stokely Enterprises	DOE Letter 8-26-91 Reprinted NuVEP: Bulletin 7-26-91
	• FSC-5945			
	Amerace (or Agastat) (Component Examples)	Electro Pneumatic Timing Relays	Amerace Control Components Supply	SENS ID #1 11-1-91 NRC I.N. 92-24
	Models: E7024 E7022			
	A through L Series Model 7032	PRB		

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Semiconductors	Solid State Devices Inc. (SSDI) SFF 9140 SPD 1511-1-11 2A14/18 or 2A14/52 SSR4045CTTXV SFF9140TWX SPMF106ANH SPD 5818 or IN5858JTXV 2N797 Unknown	P-Channel MOSFET Pin Diode (SA3059) Ion Implanted Diode SCHOTTKY Diodes Power Transistors Special Pack MOSFET Switch Axial Leaded SCHOTTKY Diode Transistor Diode (SA 3436)	SSDI	DOE Albuquerque Letter, 06-25-96 to DOD Inspector General
Starter Controls	Westinghouse (Component Examples) • A200MICAC • A201KICA • A201L2CA • AN13A	Not Provided	General Circuit Breaker & Electrical Supply HLC Electric Supply California Breakers, Inc. PENCON International (DBA) General Magnetics/Electric Wholesale ANTI THEFT Systems, Inc. (DBA) ATS Circuit Breakers and AC Circuit Breaker - Electrical Supply	NRC I.N. 88-48

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Overload Relay Thermal Unit	Square D (Component Examples) B19.5, B22	Not Provided	Not Provided	NRC I.N. 88-46
Piping, Fittings, Flanges, and Components	Tube-line Corp. Ray Miller, Inc.	Subassemblies, fittings, flanges, & other components (Carbon and Stainless Steel components)	Tube-line Ray Miller, Inc.	NRC IEB 83-06 NRC I.N. 89-18 NRC IEB 83-07 NRC I.N. 83-01
Piping, Fittings, Flanges, and Components	Piping Supplies, Inc. & West Jersey Mfg. & Chews Landing Metal Mfg.	Carbon and Stainless Steel Fittings and Flanges	Piping Supplies, Inc. & West Jersey Mfg. & Chews Landing Metal Mfg.	NRC Bulletin 88-05 & Supplements
Valves	VOGT	Full port design 2-inch Model SW-13111 & 1023	CMA International IMA Valve Refurbisher	NRC I.N. 88-48 & Supplements
	Crane	4"-1500psi, pressure sealed	Southern Cal. Valve Maintenance co., Amesse Welding Service & CMA Int.	NRC I.N. 91-09
	ITT Grinnell Valve Co., Inc	Diaphragm valves	ITT Grinnell Valve Co. Inc. Div. of Diaflo & ITT Engineered Valves	NRC Comp. Bulletin 87-02
	Crane, Pacific, Powell, Walworth & Lunkenheimer	Gate Valves	Coffeyville Valve Inc.	NRC I.N. 92-56
	Pacific	8" & 3" Globe Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.
	Crane Chapman	24" Check Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.
	Pacific	Check Valve	CMA & IMA Valve Refurbisher	NRC I.N. 88-48, Supp. & Attach.

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ATTACHMENT A - SUSPECT COMPONENTS LIST (cont.)

Component	Manufacturer/Type	Description	Supplier	References
Steel	Alloy & Carbon Steel Co. Inc., Atlantic Steel Co., Livingston Steel Co., & Copperweld Steel co.	Plate Angle Flat Bar Bar	Meredith Corporation Pressure Vessel Nuclear Alloy & Carbon Steel Co., Inc.	NRC IN. 89-56, Attachments and Supplements
Fasteners (Bolts, Screws, Nuts, and Washers)	(parentheses designated headmark) Asahi (A) Daiichi (D) Daiei (E) Fastener Co. of Japan (FM) Hinomoto Metal (H) Jin Her (J) Kyowa (K) Kosaka Kogyo (KS) Kyoei Minamida Sciyo (M) Mnato Kogyo (MS) Nippon (NF) Takai (RT) Tsukimori (S) Unytte (UNY) Yamadai (Y) Ivaco, Infasco (hollow triangled)	<ul style="list-style-type: none"> Those with suppliers or manufacturers Those that are improperly marked Those of foreign manufacture that do not meet Public Law 101-592. Fastener Quality Act 	<p>Note: Listed suppliers may also be manufacturers</p> <p>Lawrence Engineering & Supply Co. Metal Building Bolts Nichimin Corporation UNICO Ace Corporation E. K. Fasteners, Inc. H. Y. Port Fasteners Co. Kobayashi Metals, LTD. Takai Screw Mfg. Co. LTD. Yamaguchi Sesakusho Co. LTD. Highland Bolt & Nut Porteous Fastener Co. Northwest Fasteners Ziegler Bolts & Parts Co. Edgewater Fasteners, Inc. Reynolds Fasteners A & G Engineering</p>	<p>Commercial Carrier Journal Articles for: 6/88, 1/90, 2/90, 3/90, 4/90, 6/90, 7/90, 12/90</p> <p>INEL Suspect Headmark List</p> <p>SENS Report #5 2/6/91</p> <p>SENS Report #13 2/6/91</p> <p>HR 3000, U.S. House of Representatives, July 1988</p> <p>J. A. Jones, Ltr, 9/23/92</p> <p>Memo from L. Kubicek, 3/28/91</p> <p>Memo from D. Sanow, 3/8/91</p> <p>"Fastener Technology International," Feb., April, and June 1993</p> <p>Rep. J. Dingell Ltr to Comm. Dept. & NRC June 18, 1993</p> <p>Office of Nuclear Safety 93-26, 93-22, 93-11</p> <p>DOE Quality Alert, Bulletin, Issue No. 92-4, August 1992</p> <p>FDH Hanford Suspect Headmark List</p>

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ATTACHMENT B - CLASSIFICATION OF POTENTIALLY SUSPECT/COUNTERFEIT ITEMS

A. ELECTRICAL ITEMS

- Molded Case Circuit Breakers
- Motor Control Centers
 - Complete Units
 - Components
 - Starters
 - Starting coils
 - Contactors
 - Overload relays
 - Starter control relays
 - Overload heaters
- Protective/control relays
- DC power supplies/chargers
- AC inverters
- Current/potential transformers
- Exciters/regulators
- Bus transfers/auto bus transfers
- Motor generator sets
- Generators
- Rewindable motors
- Printed circuit boards
- Bulk commodity items
 - Fuses
 - Splices
 - Electrical connectors
- Indicators/controllers
- Panel lights/switches
- Transmitters/instrument switches
- Isolation devices.

The following items are excluded unless required by the applicable program/project: 600V or less: motors; outlets, switches, and plugs; boxes, conduit (i.e., bodies and covers, nipples, fittings, EMT, flex, liquid tight, rigid); wire; miscellaneous wire connections #10 and below; fixtures; lights.

B. MECHANICAL ITEMS

- Welding materials
 - Rod
 - Wire
 - Flux
- Structural members (pipe supports)
- Channel members

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ATTACHMENT C - SUSPECT/COUNTERFEIT ITEMS INFORMATION SOURCE LIST

A wide variety of industry and Government sources publish information relative to suspect/counterfeit products. The following sources provide information which is available on a continuing basis:

Industrial Fasteners Institute (IFI)

The following information is available from IFI via subscription:

- "Fastener Application Advisory" (Published Monthly)
- "North American Manufacturers Identification Markings for Fasteners"
- Fastener-related video cassettes.

The National Board of Pressure Vessel Inspectors (NBBI)

The NBBI publishes "National Board Bulletins" to alert manufacturers and users of misrepresented products as they are discovered.

National Highway Traffic Safety Administration (NHTSA)

The NHTSA's Office of Defects Investigation issued a "Suspect Bolt List" in late 1990 identifying numerous fasteners, which they determined to be misrepresented.

Trade Journals and Magazines

There are numerous trade-oriented magazines which have carried articles identifying incidents of failure of substandard parts in industry applications which have caused personal injury and death, as well as serious property damage.

Newspaper and Television Reports

Another good source of information are news reports, which provide current accounts of problems encountered as a result of misrepresented products.

U.S. Nuclear Regulatory Commission (NRC)

The NRC issues bulletins, notices, and regulatory guidance on a continuing basis to alert nuclear power utilities of potential intrusion of misrepresented products into the operations environment of operating nuclear power plants.

U.S. Department of Defense (DOD) and U.S. Department of Commerce publications are also monitored by the DOE to assure that the deficiencies identified do not contaminate DOE facilities.

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ATTACHMENT D - CHARACTERISTICS THAT MAY MAKE PRODUCTS VULNERABLE TO MISREPRESENTATION, FRAUDULENT PRACTICES, AND COUNTERFEITING

The following information has been extracted from the NRC Information Notice 89-70, Supplement 1, Attachment 3:

- High-turnover usage rate.
- No easy or practical way to uniquely mark the component itself.
- Critical characteristics, including environmental qualification not easily discernable in external visual inspection, or characteristics that are difficult to verify through receipt testing.
- May be widely used in non-critical and critical applications.
- Use may not result in used appearance.
- Often marketed through a supplier and dropped shipped from locations other than that of the original supplier.
- Special processes for ASME materials may be subcontracted (heat treating, testing, and inspections).
- Easily copied by secondary market suppliers.
- Viable salvage market.
- Reduced number of original equipment manufacturers.
- Obsolete or hard-to-get components.
- Components manufactured by a company that is no longer in business.
- Items with documentation from a plant where construction has been suspended, canceled, or deferred.
- Moderate or low cost.
- High potential for profit (rejected heats of material are purchased and decertified).

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION

It is very important to remember that just because an item is identified as being "suspect/counterfeit" it may not be appropriate to simply reject it. A review should be performed prior to formal disposition of the item to assure that it is indeed unfit for the intended application.

DETECTION METHODS**Visual Inspection**

Items may be substandard or fraudulent when:

- Nameplates, labels, or tags have been altered, photocopied, painted over, are not secured well, show incomplete data, or are missing (e.g., preprinted labels normally show typed entries).
- Obvious attempts at beautification have been made, e.g., excess painting or wire brushing, evidence of hand painting (touch-up), or stainless steel is painted.
- Handmade parts are evident, gaskets are rough cut, shims and thin metal part edges show evidence of cutting or dressing by hand tools (filing, hacksaw marking, use of tin snips or nippers).
- Hand tool marks on fasteners or other assembly parts (upset metal exists on screw or bolt heads) or dissimilar parts are evident (e.g., seven or eight bolts are of the same material and one is a different material).
- Poor fit between assembled items.
- Configuration is not consistent with other items from the same supplier or varies from that indicated in supplier literature or drawings.
- Unusual box or packing of component or item.
- The supplier is not a factory-authorized distributor.
- Dimensions of the item are inconsistent with the specifications requested on the purchase order and/or those provided by the supplier at the time of shipment.
- The item or component matches the description of one that is on a suspect items list (e.g., U.S. Customs Service "Suspect Headmark List," National Board of Boiler and Pressure Vessel Inspectors (NBBI) "Special Bulletin," etc.).

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

Fasteners

- Headmarkings are marred, missing, or appear to have been altered.
- Threads show evidence of dressing or wear (threads should be of uniform color and finish).
- Headmarkings are inconsistent with a heat lot.
- Headmarkings matching one of those identified on the U.S. Customs Service, "Suspect Headmark List" (Figure QP 3.2-1).
 - Headmarkings which depict both raised and hand-stamped markings, such as those described in WHC Quality Assurance Bulletin # 94-01, "Discrepant Dual Head Stamped Stainless Steel Bolts." This bulletin documents the results of internal inspections and independent testing of stainless steel bolts purchased to ASTM A193, Grade B8, which were found to be substandard.
 - Only manufacturers listed on the "Suspect Fastener Headmark List" (Figure QP 3.2-1) are known to produce substandard graded fasteners. If graded fasteners are discovered which exhibit headmarks matching those on the Suspect/Fastener Headmark List, they shall be considered to be defective without further testing, unless traceable manufacturer's certifications are received which provide documented evidence that the fasteners were not produced by the manufacturer listed on the Suspect Fastener Headmark List.
 - Interpretation of headmark/manufacturers listed on the "Suspect Fastener Headmark List," including newly discovered variations thereto, shall only be provided by the designated S/CI coordinator based on guidance received from the DOE.

Electrical Devices

- Connections show evidence of previous attachment (metal upset or marring).
- Connections show arcing or discoloration.
- Fasteners are loose, missing, or show metal upset.
- Molded case circuit breakers are not consistent with manufacturer-provided checklists for detecting substandard/fraudulent breakers.
- Missing or photocopied Underwriters Laboratories (UL) labels on products requiring such.

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ATTACHMENT F - SUSPECT/COUNTERFEIT PARTS DETECTION (cont.)

- Valve Body
 - Ground off casting marks with other markings stamped in the area (OEM markings are nearly always raised, not stamped)
 - Signs of weld repairs
 - Incorrect dimensions
 - Freshly sand-blasted appearance, including eye bolts, grease fittings, stem, etc.
 - Evidence of previous bolt head scoring on backsides of flanges, or evidence that this area has been ground to remove such marks
 - On a stainless valve, a finish that is unusually shiny indicates bead-blasting. A finish that is unusually dull indicates sand-blasting. The finish on a new valve is in-between.

Manufacturer's Logo

- Missing.
- Logo plate looks newer than the valve.
- Logo plate shows signs of discoloration from previous use.

Other

- Foreign material inside the valve (e.g., metal shavings).
- Valve stem packing that shows all the adjustments have been run out.
- In gate valves, a gate that is off-center when checked through the open end of the valve.
- Obvious differences between valves in the same shipment.

Price

- Price is significantly less than that of the competition.

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ATTACHMENT G - FASTENERS (cont.)

Attachment I is a Suspect/Counterfeit Headmark List that was prepared by the United States Customs Service after extensive testing of many samples of bolts from around the nation. Any bolts anywhere in the DOE community that are currently in stock, in bins, or installed that are on the Customs Headmark List should be considered suspect/counterfeit. The headmarks on this list are those of manufacturers that have often been found to have sold bolts that did not meet the indicated consensus standards. Sufficient testing has been done on the bolts on this list to presume them defective without further testing.

1.4 Precautions: Selective Testing

Some facilities (manufacturers, distributors, etc.) perform selective testing of sample bolts rather than have an independent testing laboratory run all the tests required by consensus standards. In many cases, a new counterfeit bolt has roughly the same physical strength as the graded bolt it mimics, but does not have either the chemical composition or the heat treatment specified by the consensus standards. As a result, it will stretch, exhibit metal fatigue, or corrode under less harsh service than the genuine bolt. Simple tensile strength tests cannot be used to identify substandard high-strength fasteners and should not be solely relied upon in performing acceptance test.

1.5 Using Suspect/Counterfeit Grade 5 Bolts in Grade 2 Applications

Some sites use suspect/counterfeit Grade 5 bolts in applications that only call for Grade 2 bolts. Eventually, the suspect/counterfeit Grade 5 bolts may find its way into an application that requires a genuine Grade 5 bolt and that application may fail. In some cases, cheap imported graded bolts have been purchased in place of upgraded bolts because the small price differential made the extra quality seem to be a bargain. Given the expense of removing suspect bolts from DOE facilities, the practice of using suspect bolts for any application should be discontinued.

1.6 Keep Bolts in Original Packages

All bolts purchased should be kept in the original packages, not emptied into bins. The packages should have labels or other markings that would permit them to be associated with a particular procurement action and a specific vendor. Approved supplier lists should be checked to assure that fastener suppliers on that list have been recently qualified/audited for adequacy of their quality programs.

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ATTACHMENT G - FASTENERS (cont.)

2.3 Issue

The requirements of the ASTM A193 standard regarding fastener marking and certification are very similar those required by the ASTM A320 standard discussed in the IFI advisory. The ASTM A193 standard requires that grade and manufacturer's identification symbols be applied to the heads of bolts that are larger than 1/4" in diameter. The standard, however, does not specifically differentiate between raised and depressed headmarkings, but states only that "for the purposes of identification marking, the manufacturer is considered the organization that certifies the fastener was manufactured, sampled, tested, inspected in accordance with this specification." In other words, the standard allows for some of the required markings to be formed into the head of the bolt (either raised or lowered) during manufacturing, and the rest to be applied later on via hand-stamping.

Since ASTM A193 does not differentiate between raised and depressed markings, these fasteners can be counterfeited in the same way as the ASTM A320 fasteners discussed in the November 1993 IFI warning. For example, distributors can procure 18-8 stainless steel bolts that were manufactured by an anonymous party, and without conducting the necessary upgrading process or certification testing, a second party could hand-stamp B8 and a manufacturer's marking into the heads to indicate that the fasteners exhibit the mechanical and chemical properties required of ASTM A193 Grade B8 Class 1.

Unless the certification documentation is specifically requested, and in most cases it is not, there is no way to determine by visual inspection whether these fasteners were properly certified and tested to meet the requirements of the ASTM standard.

ESHQ

Document

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CONTROL OF SUSPECT/
COUNTERFEIT ITEMS

Effective Date

December 31, 2003

ATTACHMENT H - DOE HEADMARK LIST (cont.)

Help Stamp Out Suspects/Counterfeits



Suspect Fastener Headmark List

All Grade 5 and Grade 8 fasteners of foreign origin which do not bear any manufacturers' headmarks:





Grade 5
















Grade 8

Grade 5 fasteners with the following Manufacturers' headmarks:

Mark	Manufacturer	Mark	Manufacturer
	J Jinn Her (TW)		KS Kosaka Kogyo (JP)

Grade 8 fasteners with the following Manufacturers' headmarks:




Mark	Manufacturer	Mark	Manufacturer
	A Asahi Mfg (JP)		KS Kosaka Kogyo (JP)
	NF Nippon Fasteners (JP)		RT Takai Ltd (JP)
	H Hinomoto Metal (JP)		FM Fastener Co. of Japan (JP)
	M Minamida Sieybo (JP)		KY Kyoel Mfg (JP)
	MS Minato Kogyo (JP)		J Jinn Her (TW)
	Hollow Triangle Infasco (CA, TW, JP, YU) (Greater than 1/2-inch diameter Grade 8 Hollow Triangle only)		UNY Unylite (JP)
	E Daiichi (JP)		

Grade 8.2 fasteners with the following headmarks:



Mark	Manufacturer
KS	Kosaka Kogyo (JP)

Grade A325 fasteners (Bonnelt Denver target only) with the following headmarks:

Type	Mark	Manufacturer
Type 1		A325 KS Kosaka Kogyo (JP)
Type 2		
Type 3		

Key: CA-Canada, JP-Japan, TW-Taiwan, YU-Yugoslavia

Any bolt on this list should be treated as defective without further testing.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS (cont.)

Dealing with an authorized distributor does not preclude ending up with refurbished circuit breakers. Westinghouse has announced that it is considering satisfying this market by manufacturing circuit breakers that will fit in these applications.

The solution, as recommended by NUMARC, is not to focus on the credentials of the distributor but on the traceability of the circuit breaker itself. A purchaser can be assured of having a new circuit breaker only if the breaker can be traced back to the original manufacturer.

2. Indicators of Refurbished Breakers

Typically, refurbished circuit breakers sold as new equipment have one or more of the following characteristics:

- The style of breaker is no longer manufactured.
- The breakers may have come in cheap, generic-type packaging instead of in the manufacturer's original boxes.
- Refurbished circuit breakers are often bulk-packaged in plastic bags, brown paper bags, or cardboard boxes with handwritten labels. New circuit breakers are packed individually in boxes that are labeled with the manufacturer's name, which is usually in two or more colors, and are often date stamped.
- The original manufacturer's labels and/or the Underwriter's Laboratory (UL) or Factory Mutual (FM) labels may have been counterfeited or removed from the breaker. Refurbishing operations have been known to use copying machines to produce poor quality copies of the original manufacturer's and the certifying body's labels.
- Breakers may be labeled with the refurbisher's name rather than the label of a known manufacturer.
- The manufacturer's seal (often multicolored) across the two halves of the case of the breaker is broken or missing.
- Wire lugs (connectors) show evidence of tampering.
- The surface of the circuit breaker may be nicked or scratched yet have a high gloss. Refurbishers often coat breakers with clear plastic to produce a high gloss that gives the casual observer the impression that the breaker is new. The plastic case of new circuit breakers often have a dull appearance.
- Some rivets may have been removed and the case may be held together by wood screws, metal screws, or nuts and bolts.

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ATTACHMENT I - REFURBISHED MOLDED CASE CIRCUIT BREAKERS (cont.)**5. Disposition**

- A. Segregate and retain all circuit breakers found with indications that they may be refurbished. These will be retained as potential evidence until specifically released by the Office of Inspector General and the Office of Nuclear Safety for Price Anderson Enforcement. Circuit breakers that may be refurbished may only be disposed of when the above organizations no longer need them as evidence.
- B. Report suspect electrical components to Occurrence Reporting and Processing System (ORPS). The ORPS categorization group should be identified as "Cross-Category items, Potential Concerns or issues." The description of cause section in the ORPS report should include the text "suspect counterfeit parts."
- C. Witness and document the destruction of all suspect/counterfeit circuit breakers when approval is given for disposal.

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ATTACHMENT J – ASSESSMENT/SURVEILLANCE LINES OF INQUIRY (cont.)

14. Lessons learned processes are evaluated to ensure that significant requirements and performance expectations have been established for the documentation of applicability reviews, needed actions, and actions taken for lessons learned that require line management attention and action.
15. Lessons learned requiring line management actions are integrated with the site's corrective action management processes to ensure formal tracking, feedback, and closure of actions taken.
16. Corrective actions and management procedures include formal linkage to S/CI reporting requirements for the site office, Occurrence Reporting System (ORPS), contractor General Counsel, and the IG.
17. Site mechanisms, such as a controlled product list, are established and used to maintain current and accurate information on S/CIs. Provisions are available for making this list readily available to site personnel who have S/CI responsibilities for procurement, inspection, and other areas associated with the implementation of S/CI controls.
18. S/CI training programs include the identification of positions and associated personnel required to receive training, the processes for designating those personnel who must receive initial and refresher training, and the required frequencies for refresher training.
19. All personnel involved in design, system engineering, procurement, inspection, maintenance, and other functions involving potential S/CI materials receive S/CI process and hands-on training.
20. Training programs place special emphasis on ensuring that system engineers involved in the design, procurement, and inspection of materials and components with the potential for S/CI receive such training.
21. Subcontractors involved in the procurement or handling of potential S/CI materials and components receive initial and refresher training and are knowledgeable of site S/CI processes, procedures, requirements, and controls.
22. S/CI training addresses site-specific processes and procedures for identifying, dispositioning, and reporting S/CIs, including reporting to the IG.
23. S/CI processes are subject to regular self-assessment, consistent with site self-assessment protocol.
24. Assessments are performed for S/CI processes to evaluate significant changes to the S/CI processes and to establish a baseline for implementation where appropriate. Based on that baseline review, further assessments are tailored to the maturity of the S/CI processes.
25. S/CI lines of inquiry are considered and evaluated, as appropriate, during assessments of areas that interface with S/CI processes (procurement process, NCR process, etc.).

TECHNICAL SPECIFICATION
AMEC Americas Limited

PROJECT:	Final DBVS Design	145579-D-SP-023
PROJECT NO.:	145579	APPENDIX B
CLIENT:	AMEC E&E – Richland, WA	Carboline® - Thermaline® 4700 Product Data

APPENDIX B
Carboline® - Thermaline® 4700 Product Data

TECHNICAL SPECIFICATION
AMEC Americas Limited


PROJECT:	Final DBVS Design	145579-D-SP-023
PROJECT NO.:	145579	APPENDIX B
CLIENT:	AMEC E&E - Richland, WA	Carboline® - Thermaline® 4700 Product Data

product data

Thermaline® 4700
& 4700 Aluminum

Selection & Specification Data

Generic Type	Single package silicone finish (air-drying)
Description	High-performance finish for areas exposed to extreme temperatures. Suitable for service from 400°F-1000°F (204°C-538°C). Color stability at maximum temperature will depend on color selected. Requires heat curing.
Features	<ul style="list-style-type: none"> Resistant to severe thermal shock Provides outstanding long-term performance when applied over Carboline Inorganic zinc primers
Color & Dry Temperature Resistance *	<p>Available in the following stock colors:</p> <p>Black (C900) 1000°F (538°C) Continuous Aluminum (C901) 1000°F (538°C) Continuous Black and Aluminum allow surges to 1200°F (649°C) Gray (C705) 750°F (399°C)</p> <p>All other colors are made to order and have temperature resistance in the 650-750°F (343°C-399°C) range.</p>
Finish	Gloss (Flat at High Temp)
Primers	Inorganic zincs. None needed for stainless steel or aluminum.
Topcoats	Normally none
Dry Film Thickness	<p>2 mils (50 microns), 4 wet mils (100 microns) Do not exceed 2.0 mils in a single coat.</p> <p>4700 Aluminum: 1.5 mils (40 microns) Two coats are recommended over stainless steel and one or two coats over Inorganic zincs.</p>
Solids Content	<p>By Volume: 48% ± 2 4700 Aluminum by volume: 30% ± 2</p>
Theoretical Coverage Rate	<p>770 m²/gal. (18 m²/l at 25 microns) 4700 Aluminum: 481 m²/gal. (12 m²/l at 25 microns).</p>
VOC Values	<p><u>As Supplied:</u> (sprayed un-thinned except in hot application) Thinned: 12.8 oz/gal w/#235 (10%) 4.1 lbs./gal (492 g/l)</p> <p><u>4700 Aluminum supplied:</u> 5.04 lbs./gal (604 g/l) Thinned: 8 oz/gal w/#10 (6%) 5.15 lbs./gal (618 g/l) 15 oz/gal w/#10 (12%) 5.27 lbs./gal (632 g/l)</p>
Limitations	<ul style="list-style-type: none"> Do not use for immersion service. Do not exceed thickness recommendation. Excessive film thickness may result in blistering and delamination when the temperature is increased.

Substrates & Surface Preparation

General	Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.
Steel	SSPC-SP 10 with a 0.5-1.0 mils (12-25 micron) surface profile. Prime with specific Carboline primers as recommended by your Carboline sales representative.
Stainless Steel	Sweep blast cleaning (SSPC-SP7) is recommended.
Aluminum	Sweep blast cleaning (SSPC-SP7) is recommended.

* The alignment of aluminum flakes in aluminum-ried finishes is very dependent on application conditions and techniques. Care must be taken to keep conditions as constant as possible to reduce variations in final appearance. It is also advisable to work from a single batch of material since variations can occur from batch to batch. For more information consult Carboline Technical Service Department.

August 2003 replaces April 2003

4700/4701

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. Users must contact Carboline Company to verify correctness before specifying or applying. No guarantee of economy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for storage, performance or safety testing in use. Liability, if any, is limited to replacement of product. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Carboline and Thermaline are the registered trademarks of Carboline Company.

TECHNICAL DATA SHEET
AMEC Americas Limited


The document revision number is indicated below. Please replace all revised pages of this document and destroy the superseded copies.

PROJECT:	Final DBVS Design	145579-D-DS-023.1	REV. 0
PROJECT NO.:	145579	ICV TM Box and Lid Datasheet	
CLIENT:	AMEC E&E - Richland, Washington	Equip. No's: 35-D52-006, 35-D52-012	

REV. NO.	ISSUED FOR	ORIGIN	DATE	INITIAL
A	Internal Review	VL	07-Oct-04	VL
B	Internal Approval	VL	21-Oct-04	VL
C	CH2M Hill Review	VL	02-Nov-04	VL
0	Bid Request	VL	04-Mar-05	VL

DOCUMENT APPROVAL
CLIENT APPROVAL (AMEC RICHLAND)
Original Approvals on File

Project Manager: _____

Date: _____

Q.A. Rep.: _____

Date: _____

CLIENT APPROVAL (CH2M HILL)

Project Manager: _____

Date: _____

AMEC AMERICAS LIMITED (TRAIL)
Original Approvals on File
Project Manager: J. HillDate: Mar 7, 2005Discipline Lead: J. HillDate: Mar 7/05Originator: Victor LamericaDate: March 7, 2005



TECHNICAL DATA SHEET

PROJECT:	Final DBVS Design	145579-D-DS-023.1	REV. 0
PROJECT NO.:	145579	ICV™ Box and Lid Datasheet	
CLIENT:	AMEC E&E - Richland, Washington	Equip. No's: 35-D52-006, 35-D52-012	

REFERENCE SPECIFICATION

Document No.	Specification
145579-D-SP-023	ICV™ Box and Lid

CONTENTS

Data Sheet 2 Pages

Bidders Drawing & Data Commitments Sheet 1 Page



TECHNICAL DATA SHEETS

PROJECT:		Final DBYS Design		145579-D-DS-023.1		REV.		0	
PROJECT NO.:		145579		ICV Box and Lld Datasheet					
CLIENT:		AMEC E&E - Richland Washington		Equip. No's: 35-D52-006, 35-D52-012					
No. Required		50		Area		35			
PFD #		F-145579-00-A-0021		Stream No.					
Reference Specification:		145579-D-SP-023		Quality Assurance Level		EQ			
Operating Conditions									
Location (Indoors/Outdoors)		Outdoors		A		System Operation			
Environmental conditions						- Days per year		365	
Ambient Temperature (°F)						- Hours per day		24	
Min.		-25		A		Availability		95	
Max.		115		A		Elevation (ft)		663	
Operation		one cycle		A		Environment		Yes	
Operating Pressure		(in WG)		-1		- Radioactive		Yes	
Max Vacuum		(in WG)		-2		- Toxic		Yes	
						- Corrosive		Yes	
						- Flammable		No	
Design Data (see note 2)									
Tank Dimensions (Inside Dimensions)						Nominal Capacity (ft³) (of shell)		1350	
Length (ft)		24		A		Heating/Cooling		Heating (Electrodes)	
Height (ft)		7.5		A		Shell Temp (°F)		Min.	
Width (ft)		7.5		A		Max.		Ambient	
Lid Overall Dimensions (Overall Dimensions)						Radiation Dose		(mrem/hr)	
Length (ft)		24.7		A				1060	
Height (ft)		1.71		A				40	
Width (ft)		8.2		A					
		4		A					
		2		A					
Process Data									
Process Material		Glass		A		Process Temp (°F)		2370	
S.G. Liquid/Solid		2.65		0					
Material Specifications									
Shell Plate		ASTM A36		A		Gasket		Pyrotek Fiberscal Blanket M-6 or Equal	
Stiffeners (HSS)		ASTM A500 Grade C		A		Note:		The gasket mentioned above is the one	
Reinforcing Pads		ASTM A36		A		located between the Lid and top of the ICV Box			
Bolts		N/A		A		see drawing F-145579-35-D-0004			
Nuts		ASTM A193 Grade B8		A					
Internal		N/A		A					
External		ASTM A194 Grade 8 Heavy Hex		A					
Fabrication Data									
Welding Standard (see note 1)		AWS D1.1		A		Lifting Lugs -		(for empty container)	
Testing		Watertight		A		Spreader Bar		(see note 6)	
								(see note 3)	
								ASME B30.20	
Date		07-Oct-04		21-Oct-04		02-Nov-04		09-Mar-05	
By		VL		VL		VL		VL	
Chkd									
Rev.		A		B		C		0	



TECHNICAL DATA SHEETS

PROJECT:	Finat DBVS Design	145579-D-DS-023.1	REV. 0
PROJECT NO.:	145579	ICV™ Box and Lid Datasheet	
CLIENT:	AMEC E&E - Richland, Washington	Equip. No's: 35-D52-006, 35-D52-012	

BIDDERS DRAWING AND DATA COMMITMENTS

Vendor shall supply all drawings, manuals and documentation in the quantities indicated. Approval drawings are due within the listed number of calendar days after issue of the Purchase Order or Letter of Intent. The dates set out for drawing and data submissions are governed by the engineering design schedule of the project. The Vendor shall supply one AutoCAD disk file and requested number of copies within the listed number of calendar days. Final drawings must be certified as correct and bear the Vendors name, equipment number and Purchase Order Number. Drawing Transmittals listing the document numbers, revisions numbers, quantities, status and document types must be included with all submissions (including electronic submittals).

SEND ALL DOCUMENTS TO:

Submit all documents via courier service
 Faxed documents must be followed by the originals.
 Electronic E-mail or FTP transmissions of drawings & data must be copied to Document Control
 Always include a transmittal

AMEC Americas Limited
 1385 Cedar Avenue
 Trill, BC, Canada
 V1R 4C8
 Attn: Document Control
 Phone: (250) 368-2400
 Fax: (250) 368-2401

BIDDERS MUST PROVIDE ESTIMATED LEAD TIMES FOR APPROVAL DRAWINGS

Proposal Bidder shall include this data for each item				REVIEW ITEMS DUE	VENDOR COMMITMENT
	Review	Required before ordering or start of fabrication			
		Final	Required within 7 days prior to shipment and before final payment	WITHIN	(SEE NOTE 4)
PROPOSAL	REVIEW	FINAL	DESCRIPTION	(DAYS)	(DAYS)
1			QA program that satisfies the requirements of ASME NQA-1-1994	Bid	
1			Experience list and maintainability information	Bid	
E+3	E+3		Design, fabrication & delivery schedule	PO+7	
	E+3		Factory Acceptance Test Plan	PO+7	
	E+1	E+1	NDE personnel certifications	PO+7	
	E+1	E+1	Visual weld/NDE procedures	PO+7	
	E+3	E+1	Welding procedures, weld map, procedure qualification records and welder qualification records	PO+7	
	E+3	E+1	AWS CWI certificate	PO+7	
	E+3	E+3	Protective coating test procedure	PO+7	
	E+1	E+1	Vendor cut sheets	PO+14	
E+3	E+3	E+6	Outline drawings and layout drawings indicating weights and dimensions for lifting device	PO+14	
E+3	E+3	E+6	Nameplate data	PO+14	
	E+3	E+6	Calculations for spreader bar	PO+14	
	E+3	E+6	Bracing and shipping plan for transport and delivery of boxes	PO+14	
		6	As built of fabricated items	Del-7	
		6	Material Certificates	Del-7	
		6	Test results	COM+14	

THE TIMELY RECEIPT OF THE VENDOR DOCUMENTS IS CRITICAL TO THIS PROJECT
 BUYER COMMITS TO A 10 DAY TURNAROUND ON REVIEW ITEMS

I agree to provide the listed documentation and data and the dates shown above.

Vendor Signature

Date

REFERENCE DRAWINGS	
1	F-145579-35-D-0005
2	F-145579-35-D-0006
3	F-145579-35-D-0008
4	F-145579-35-D-0012
5	F-145579-35-D-0014
6	F-145579-35-D-0021
7	F-145579-35-D-0016

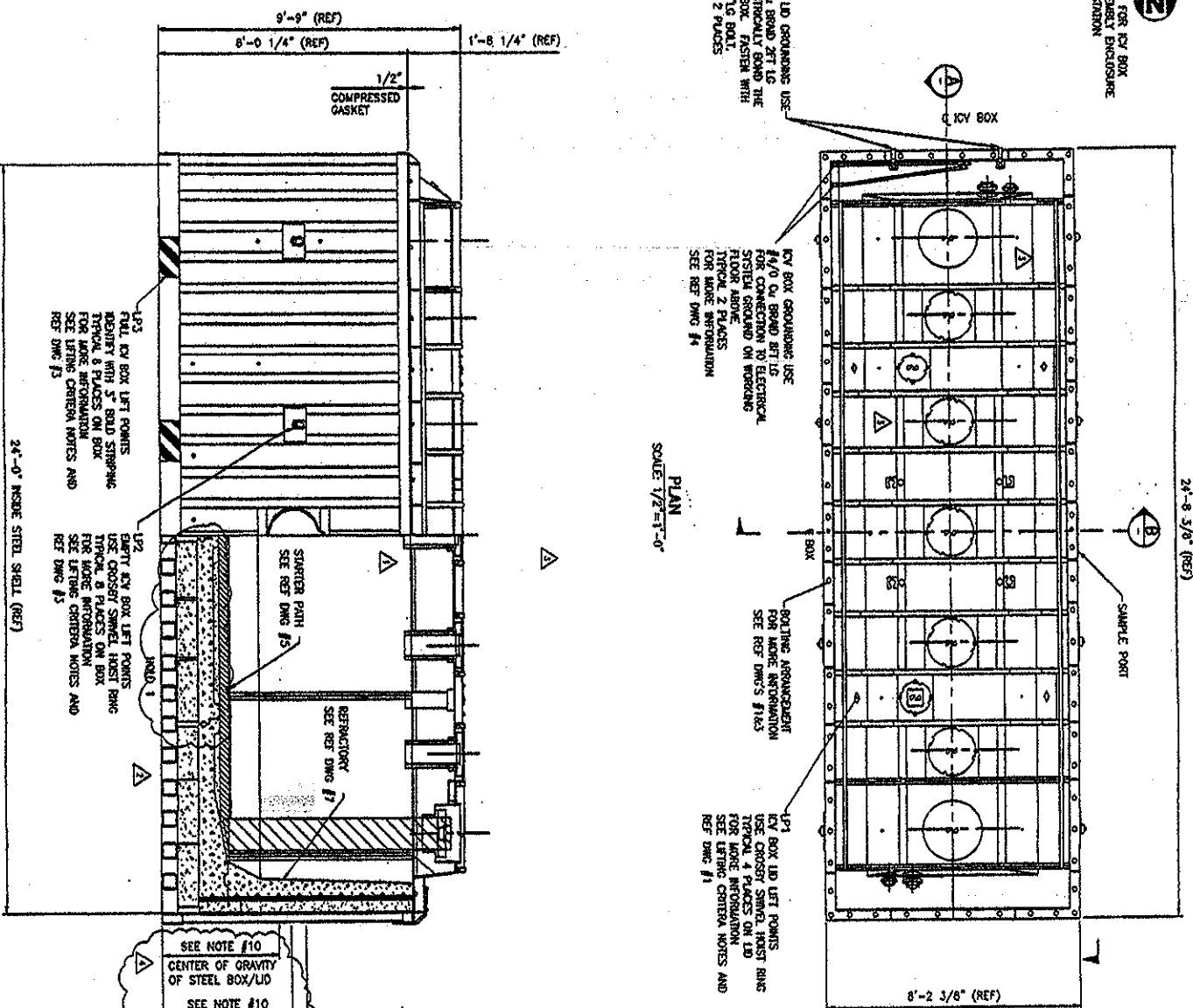
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GENERAL NOTES:

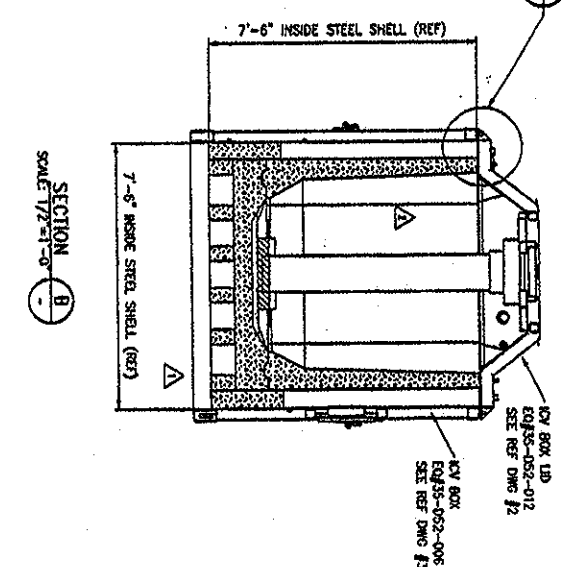
1. ICV BOX SHALL BE CONSTRUCTED WITH ALL INTER JOINTS SEAL WELDED (WATERPROOF).
2. FINISH CONSTRUCTION DIMENSIONS, TOLERANCE SHALL BE $\pm 1/16"$.
3. PROVIDE DRAIN HOLES TO ALLOW FOR NO WATER RETENTION ON TOP OF BOX LID.
4. ALL FINISH DIMENSIONS SHALL BE IN ACCORDANCE WITH ASME B16.5.
5. FOR ICV BOX DETAILS SEE DWG. F-145579-35-D-0006.
6. FOR ICV BOX LID DETAILS SEE DWG. F-145579-35-D-0006.
7. SUPPLY CROSSBOW LIFTING DEVICES MODEL HR-125 (1016920) (OR EQUAL).
8. NAME PLATES SHALL BE PROVIDED FOR THE ICV BOX AND LID (OR EQUAL).
9. NAME PLATES SHALL BE PROVIDED FOR THE ICV BOX AND LID (OR EQUAL).
10. ALL FINISH DIMENSIONS SHALL HAVE ± 0.005 TOLERANCE UNLESS OTHERWISE SPECIFIED.
11. FOR CENTER OF GRAVITY DIMENSIONS SEE F-145579-35-D-0006.

LIFTING CRITERIA

1. ICV BOX LID
 2. EMPTY BOX
 3. FULL BOX
 4. ALL SWAGEL HOIST RINGS TO BE TORQUED TO 80 FT LBS.
1. ICV BOX LID
2. EMPTY BOX
3. FULL BOX
4. ALL SWAGEL HOIST RINGS TO BE TORQUED TO 80 FT LBS.



SECTION A
SCALE 1/2"=1'-0"



SECTION B
SCALE 1/2"=1'-0"

HOLDS	
1	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)
2	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)
3	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)
4	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)

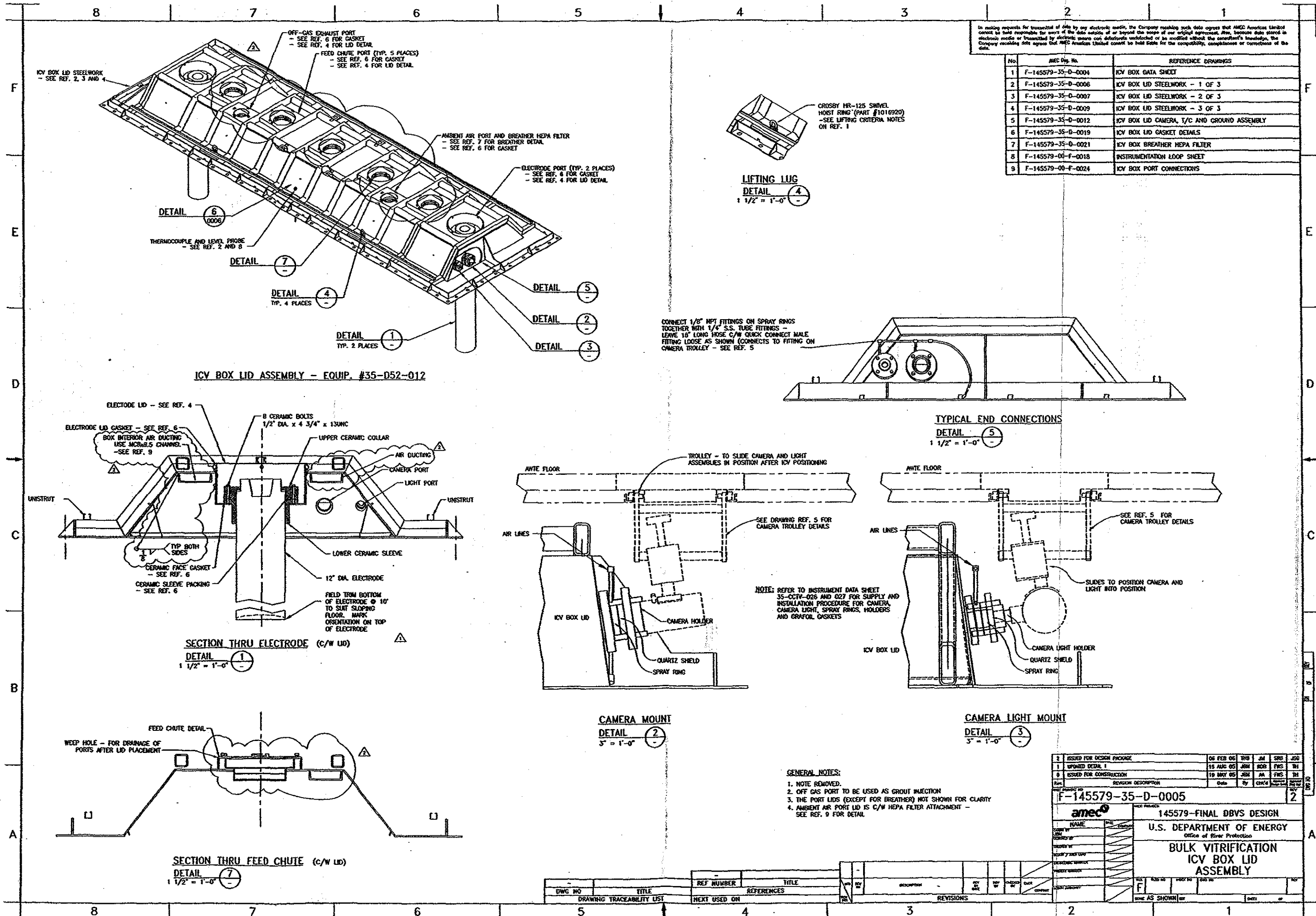
F-145579-35-D-0004	
1	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)
2	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)
3	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)
4	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)

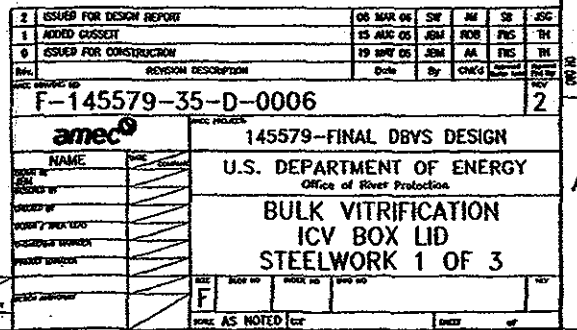
U.S. DEPARTMENT OF ENERGY
Office of Energy Research
BULK VITRIFICATION
ICV BOX
DATA SHEET

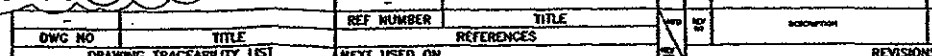
DRAWING TRACKABILITY LIST	
DWG NO.	DATE
1	10/1/83
2	10/1/83
3	10/1/83
4	10/1/83
5	10/1/83
6	10/1/83
7	10/1/83
8	10/1/83

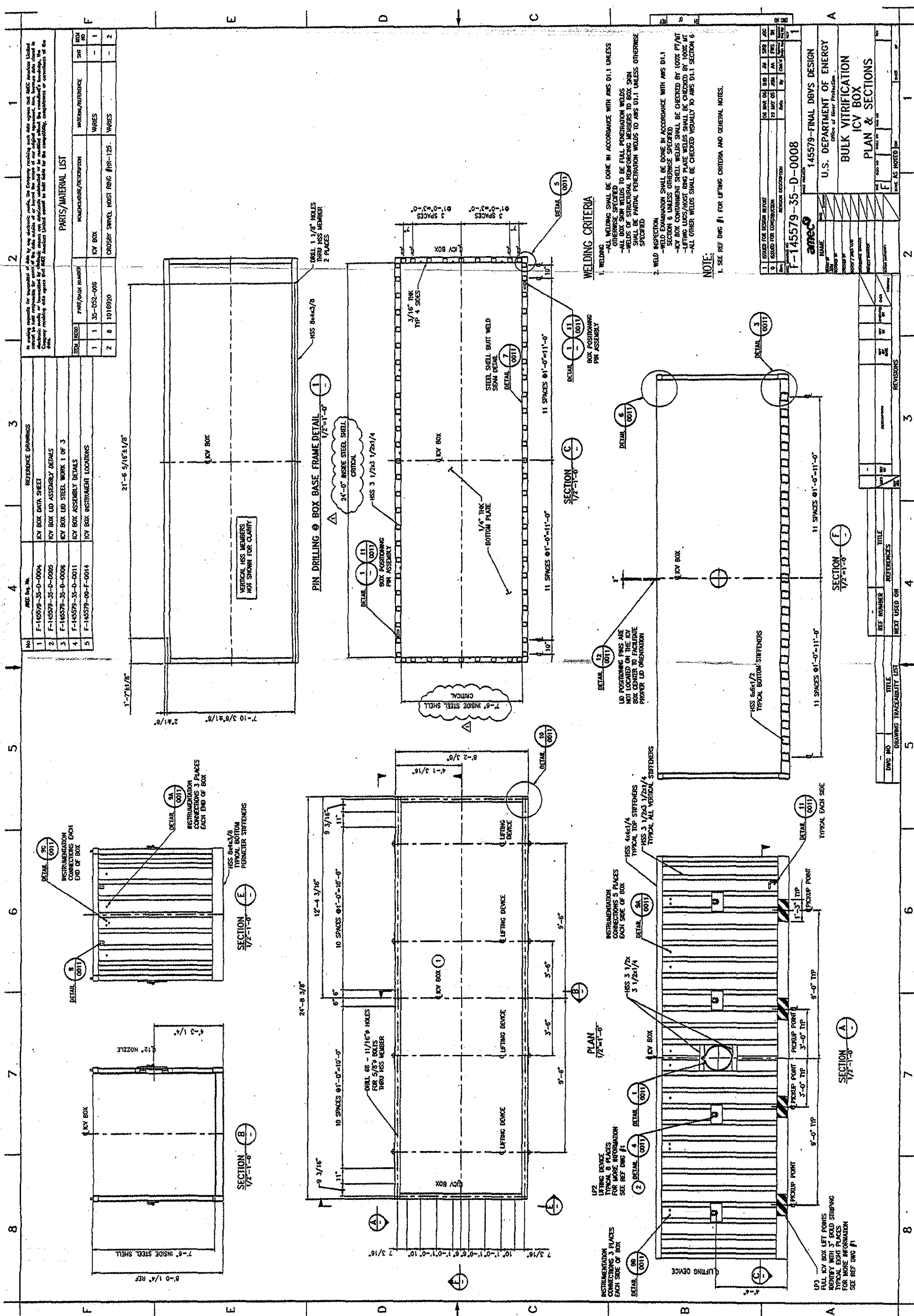
MATERIAL SPECIFICATIONS	
ITEM	DESCRIPTION
1	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)
2	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)
3	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)
4	ICV REFRACTORY ASSEMBLY DIMENSIONS (ON-HOLD UNTIL VENDOR DESIGN OF NEW JAW DESIGN)

PROCUREMENT QUANTITY	
ITEM	QUANTITY
1	1
2	1
3	1
4	1







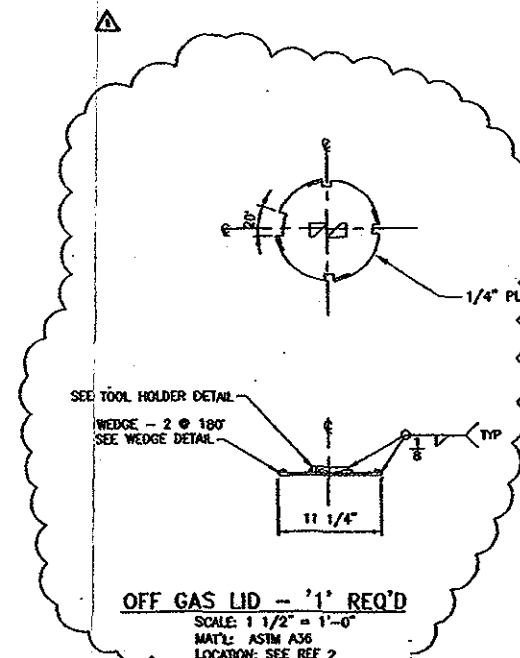
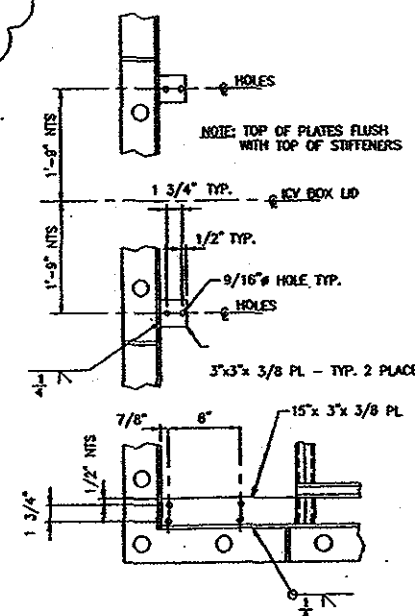
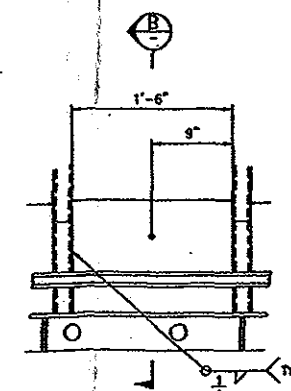
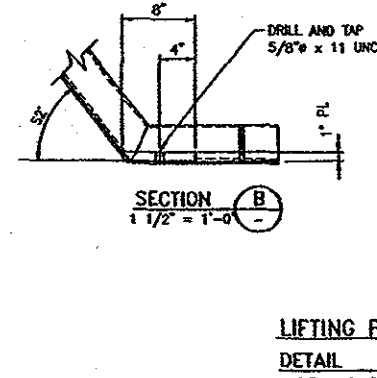
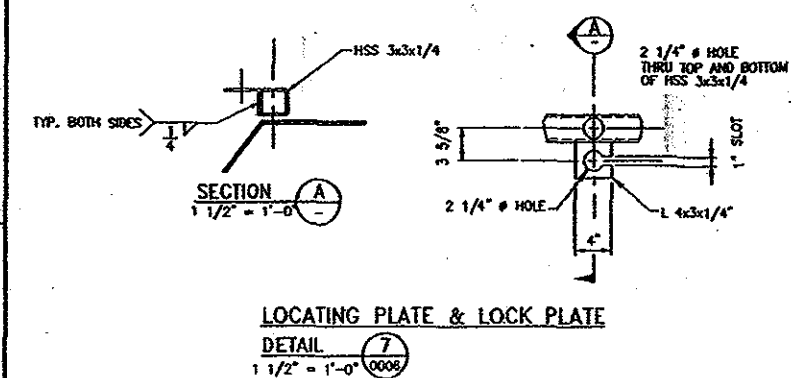
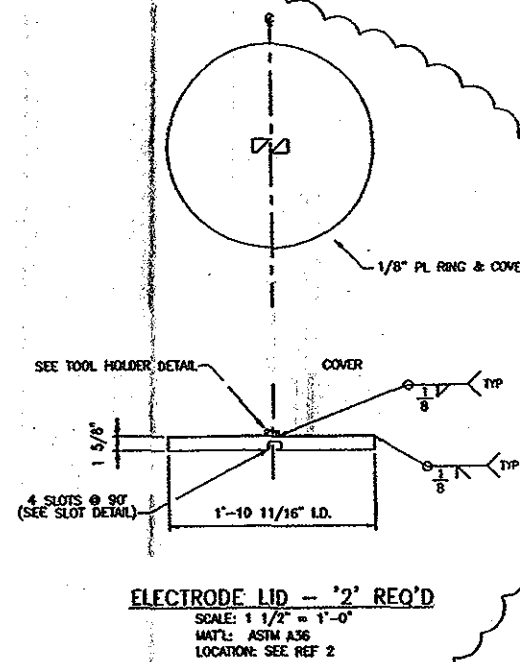
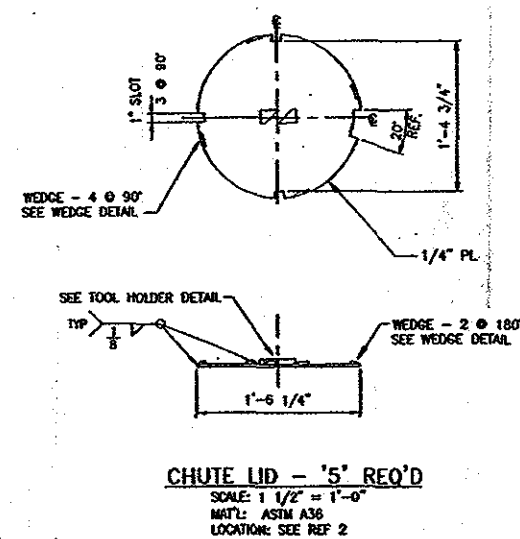
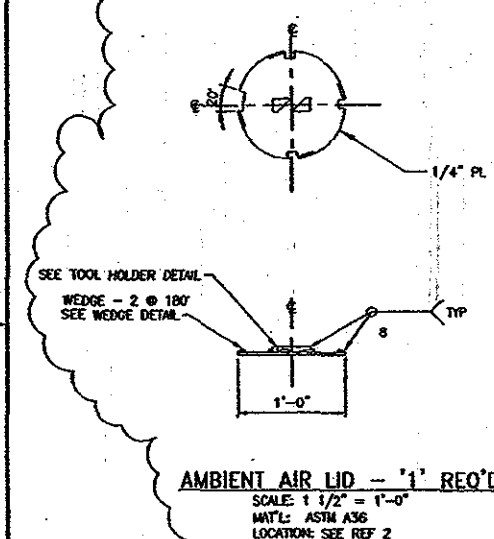
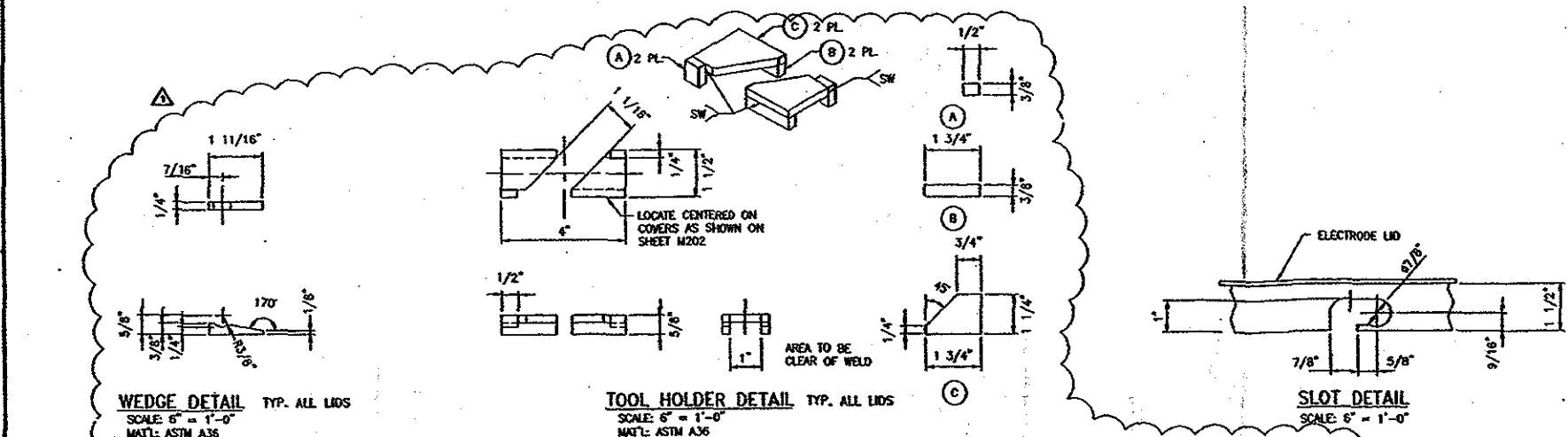


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No.	AMEC Des. No.	REFERENCE DRAWINGS
1	F-145579-35-D-0004	ICV BOX DATA SHEET
2	F-145579-35-D-0005	ICV BOX LID ASSEMBLY
3	F-145579-35-D-0006	ICV BOX STEELWORK 1 OF 3
4	F-145579-35-D-0009	ICV BOX STEELWORK 3 OF 3
5	F-145579-35-D-0022	LID HANDLING TOOL

GENERAL NOTES:

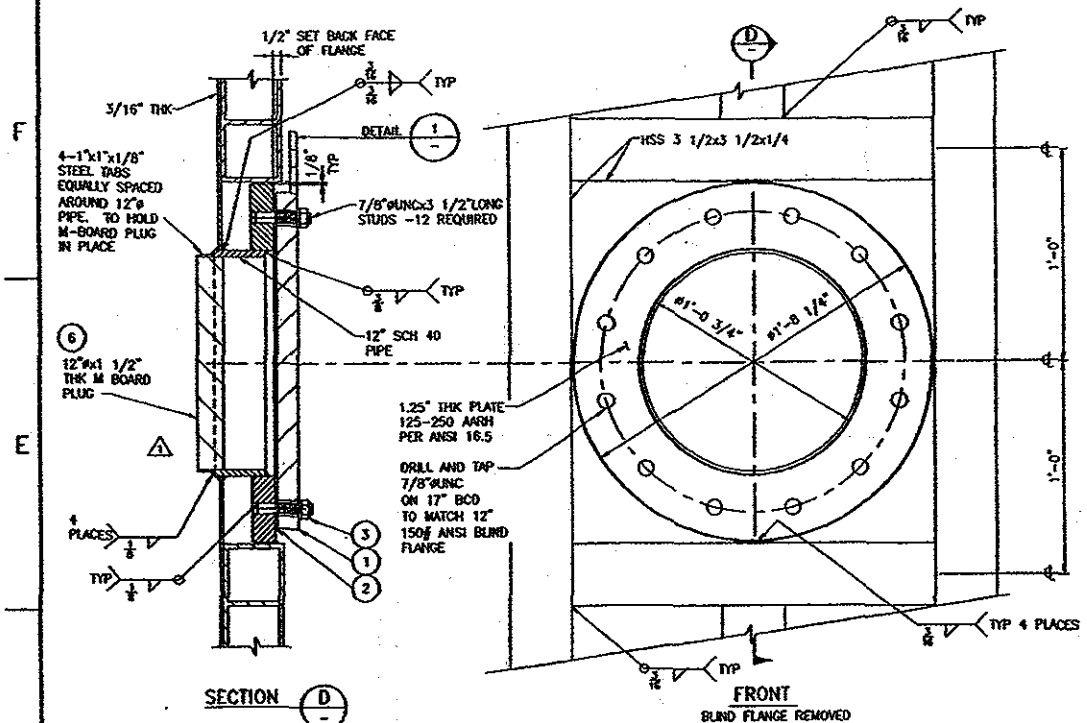
1. ALL DIMENSIONS MARKED WITH * HAVE MAX. TOLERANCE + OR - 1/16"
2. ALL ITEMS TO BE FABRICATED FROM:
STRUCTURAL SHAPES - ASTM A36 OR BETTER
PIPE - ASTM A53, GR.B
PIPE FITTINGS - ASTM A105
3. QUANTITIES MARKED FOR LBS REPRESENT TOTAL FOR 1" ICV BOX LID ONLY



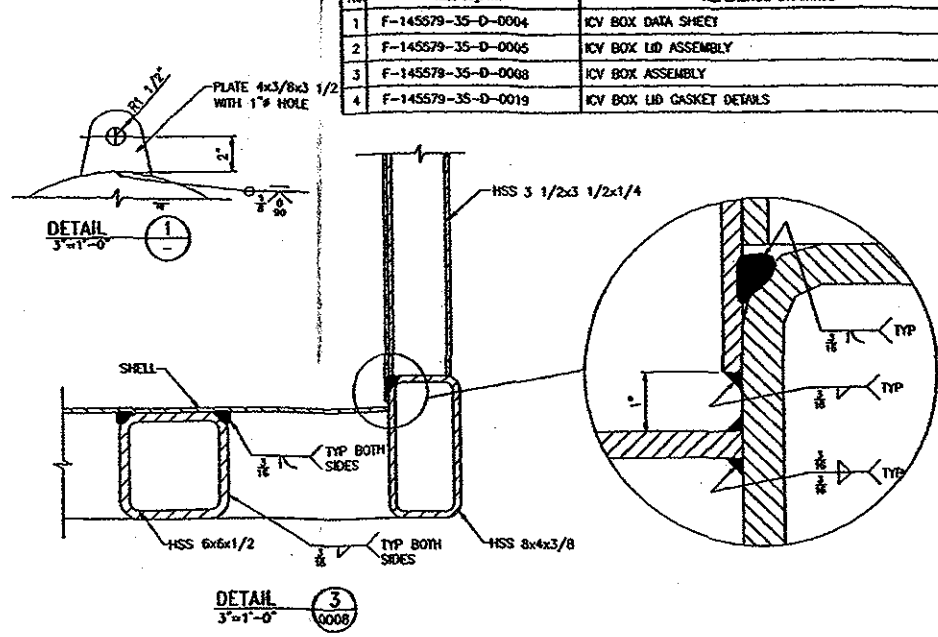
1	ISSUED FOR DESIGN PACKAGE	06 MAR 05	TSD	JM	SDB	JSC
0	ISSUED FOR CONSTRUCTION	19 MAY 05	JEM	AA	PMS	DH
Date	REVISION DESCRIPTION	Date	By	CAC'd	Permitted	Rev
F-145579-35-D-0009						
amec		PROJECT NUMBER: F-145579-FINAL DBVS DESIGN				
NAME _____ DATE _____ DESIGNED BY _____ CHECKED BY _____ DATE / MONTH / YEAR _____ CONSTRUCTION METHOD _____ REVISED WORK _____		U.S. DEPARTMENT OF ENERGY Office of River Protection BULK VITRIFICATION ICV BOX LID DETAILS STEELWORK 3 OF 3				
SHEET NO. _____		SHEET NO. _____		SHEET NO. _____		REV.
SHEET AS NOTED OR		SHEET				OF

AMEC Dwg. No.		REFERENCE DRAWINGS
1	F-145579-35-D-0004	ICV BOX DATA SHEET
2	F-145579-35-D-0005	ICV BOX LID ASSEMBLY
3	F-145579-35-D-0008	ICV BOX ASSEMBLY
4	F-145579-35-D-0019	ICV BOX LID GASKET DETAILS

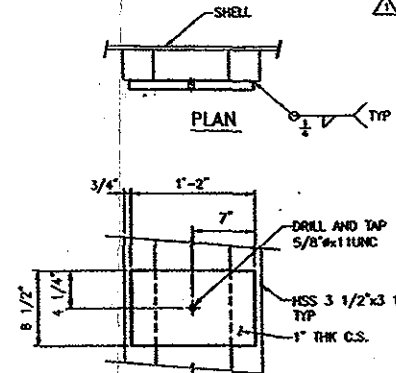
PARTS/MATERIAL LIST					
ITEM	QTY	UNIT	DESCRIPTION	MATERIAL/REFERENCE	REV
1	1		12" 150# ANSI BLIND FLANGE	ASTM A105	1
2	1		12" GASKET FLEXITALLIC H.O.T.	1/8" CERAMIC	2
3	12		7/8" HEV. HEX. NUTS	ASTM A194 G 8B	3
4	68		5/8"x7" LG BOLTS C/W NUTS&WASHERS	BOLTS ASTM A193 G 8	4
5	68		NUTS ASTM A194 G 8B HEV. HDL		5
6	1		2 1/2"x1/4" THK C/W 11/16" HOLE	ASTM A36	6
7	1		12"x1 1/2" THK FILLER BOARD	KNOWLED M BOARD	7



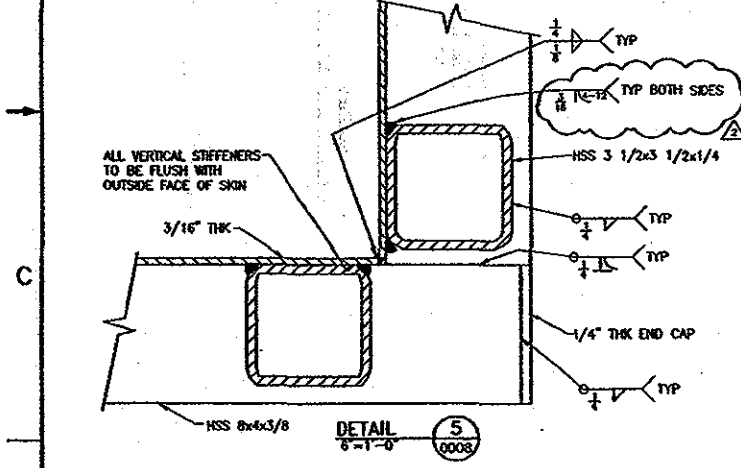
SAMPLE PORT DETAIL 1 3'-1'-0" 0008



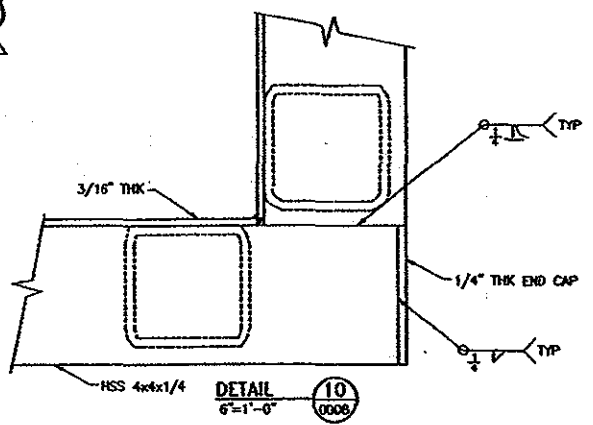
DETAIL 3 3'-1'-0" 0008



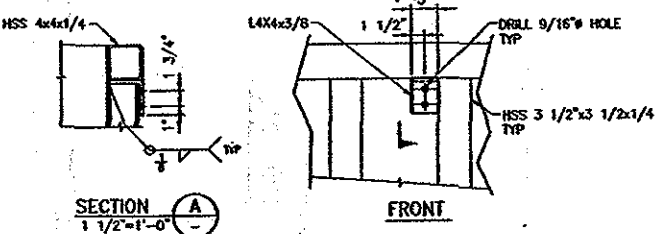
LIFTING DEVICE MOUNT DETAIL 4 1'-2"-1'-0" 0008



DETAIL 5 6'-1'-0" 0008

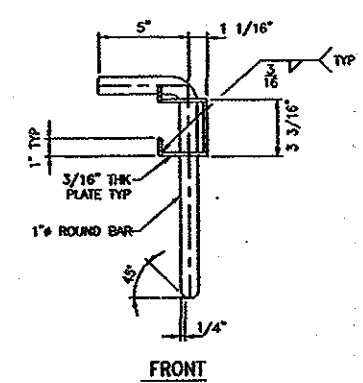
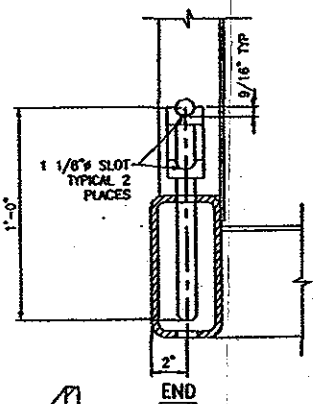


DETAIL 10 6'-1'-0" 0008

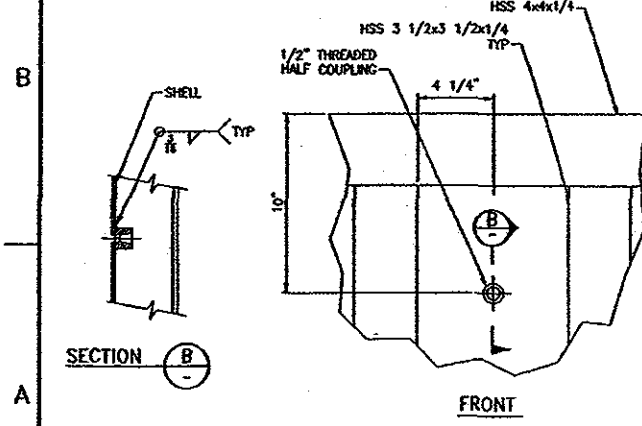


SECTION A 1'-2"-1'-0" 0008

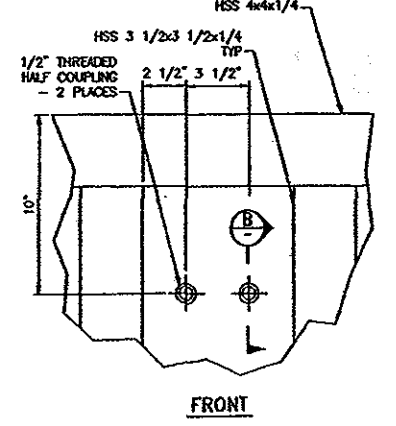
GROUNDING TAB DETAIL 8 1'-2"-1'-0" 0008



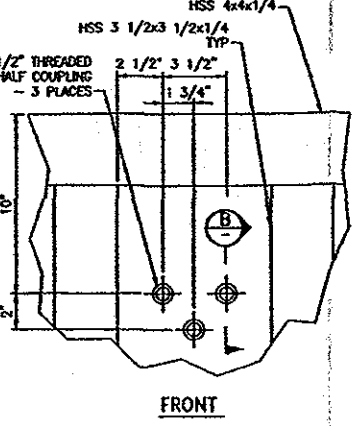
BOX POSITIONING PIN DETAIL 11 3'-1'-0" 0008



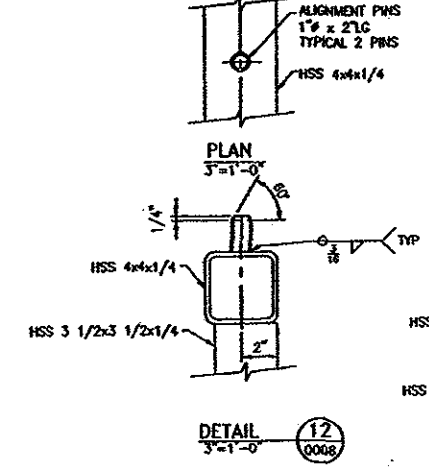
FRONT 3'-1'-0" 0008



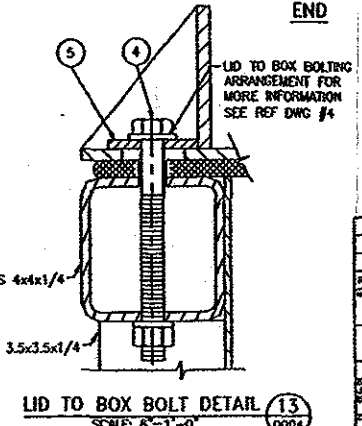
FRONT 3'-1'-0" 0008



FRONT 3'-1'-0" 0008



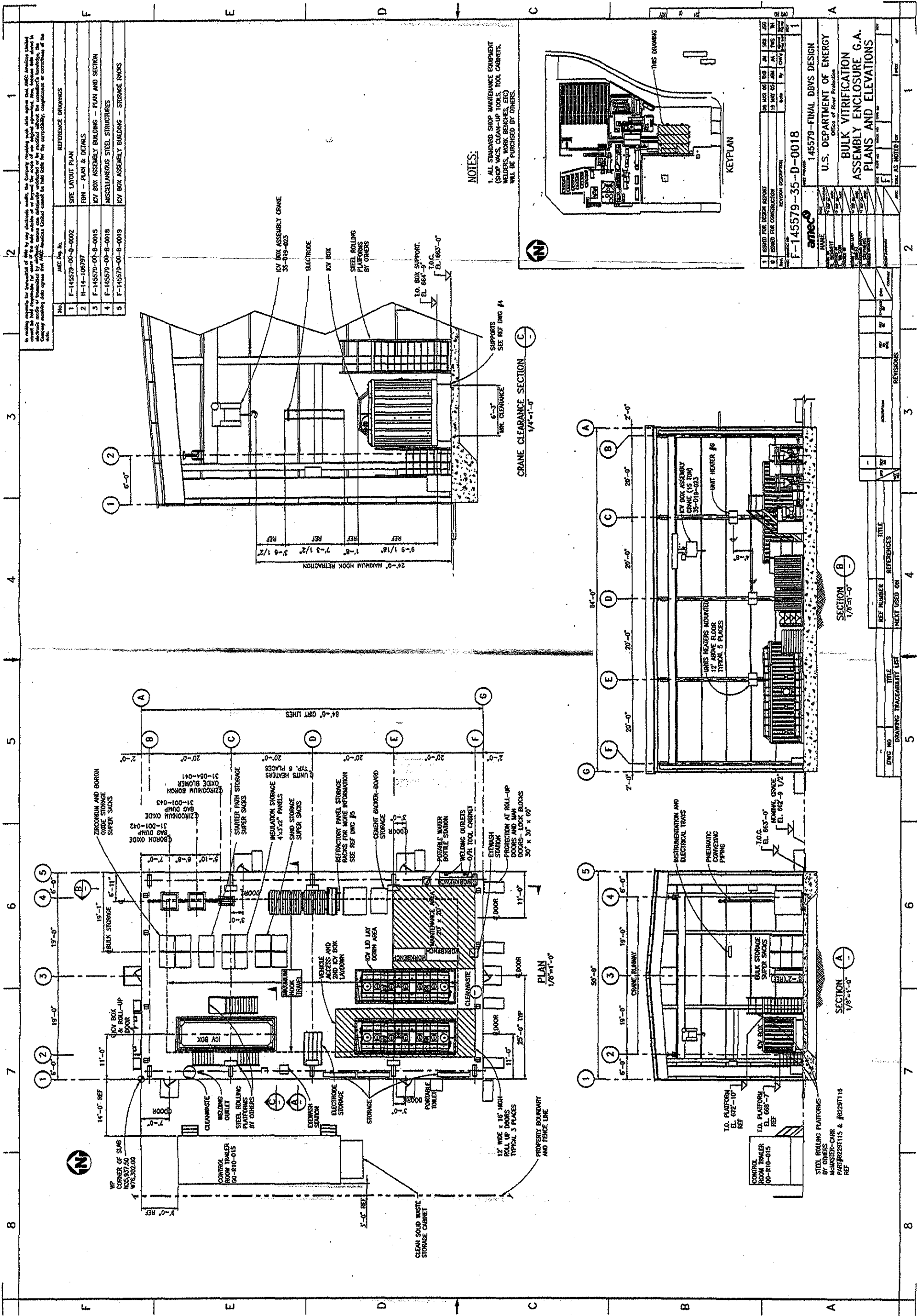
DETAIL 12 3'-1'-0" 0008



LID TO BOX BOLT DETAIL 13 3'-1'-0" 0008

DWG NO	TITLE	REF NUMBER	TITLE	REV	DATE	BY	CHKD	APPD
1	ICV BOX DATA SHEET	1	ICV BOX DATA SHEET	1	15 AUG 05	JEM	ROE	FMS
2	ICV BOX LID ASSEMBLY	2	ICV BOX LID ASSEMBLY	1	19 MAY 05	JEM	AL	FMS
3	ICV BOX ASSEMBLY	3	ICV BOX ASSEMBLY	1	19 MAY 05	JEM	AL	FMS
4	ICV BOX LID GASKET DETAILS	4	ICV BOX LID GASKET DETAILS	1	19 MAY 05	JEM	AL	FMS

2	ISSUED FOR DESIGN REPORT	06 MAR 06	THD	SW	SRD	JSC
1	ADDED 12" M-BOARD PLUG TO SAMPLE PORT	15 AUG 05	JEM	ROE	FMS	TH
0	ISSUED FOR CONSTRUCTION	19 MAY 05	JEM	AL	FMS	TH
REVISION DESCRIPTION						
Rev	By	Date	By	Chk'd	App'd	Rev
F-145579-35-D-0011						
amec						
145579-FINAL DBVS DESIGN						
U.S. DEPARTMENT OF ENERGY						
Office of River Protection						
BULK VITRIFICATION						
ICV BOX						
ASSEMBLY DETAILS						



1. ISSUED FOR DESIGN BEFORE		DATE	BY	CHKD	APPD
2. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
3. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
4. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
5. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
6. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
7. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
8. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
9. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
10. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
11. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
12. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
13. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
14. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
15. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
16. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
17. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
18. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
19. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD
20. ISSUED FOR CONSTRUCTION		DATE	BY	CHKD	APPD

145579-FINAL DBVS DESIGN
U.S. DEPARTMENT OF ENERGY
Office of River Protection
BULK VITRIFICATION
ASSEMBLY ENCLOSURE G.A.
PLANS AND ELEVATIONS
F-145579-35-D-0018

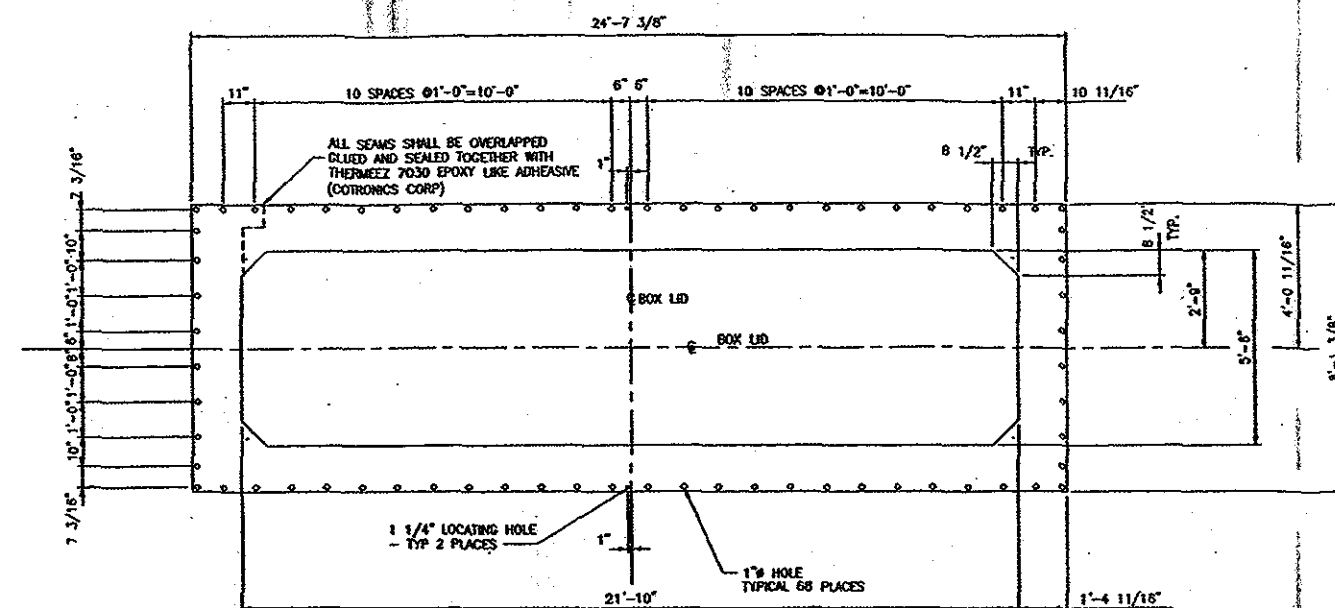
DWG NO.	TITLE	REF NUMBER	REFERENCES	REVISIONS
1	145579-FINAL DBVS DESIGN			
2	U.S. DEPARTMENT OF ENERGY			
3	Office of River Protection			
4	BULK VITRIFICATION			
5	ASSEMBLY ENCLOSURE G.A.			
6	PLANS AND ELEVATIONS			
7	F-145579-35-D-0018			
8				
9				
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20				

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No.	AWC Des. No.	REFERENCE DRAWINGS
1	F-145579-35-D-0004	ICV BOX DATA SHEET
2	F-145579-35-D-0005	ICV BOX LID ASSEMBLY
3	F-145579-35-D-0008	ICV BOX PLAN AND SECTIONS

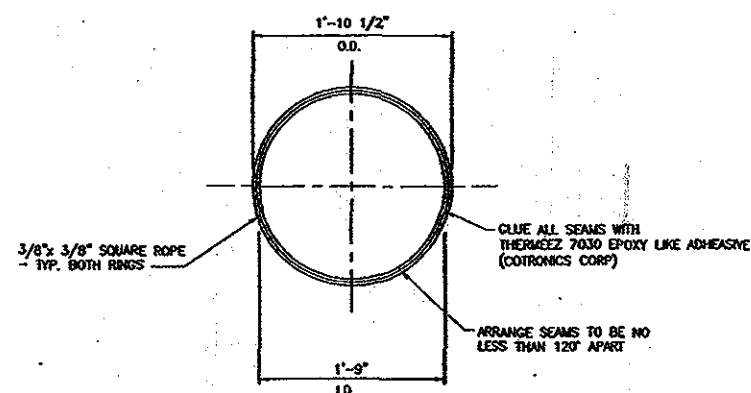
GENERAL NOTES:

1. QUANTITIES MARKED FOR ITEMS REPRESENT TOTAL FOR "1" ICV BOX LID ONLY
2. MATERIALS: AS NOTED



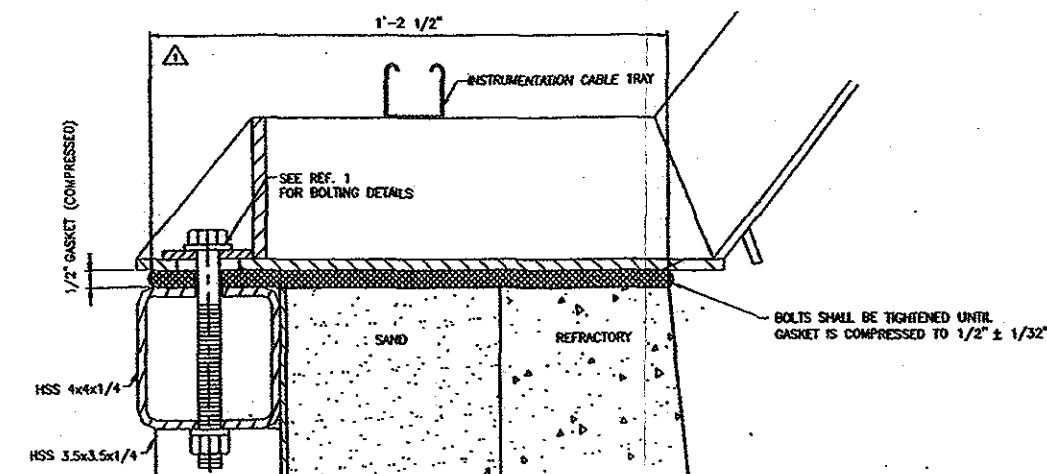
BOX LID GASKET - '1' REQ'D

MAT'L: 1" THICK 8# NA FIBRESEAL BLANKET OR EQUIV.
LOCATION: SEE REF. 2 & 3



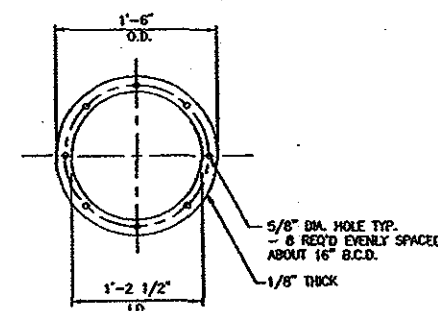
ELECTRODE LID GASKET - '2' REQ'D

SCALE: 1 1/2"=1'-0"
MATERIAL: C9 CERAMIC FIBER OR EQUAL
LOCATION: SEE REF. 2



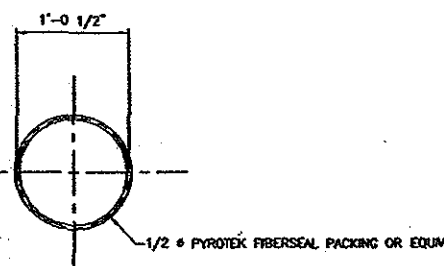
LID TO BOX GASKET CLOSURE DETAIL

DATE: 6-1-73




CERAMIC FACE GASKET - '2' REQ'D

SCALE: 1 1/2"=1'-0"
MAT'L: PYROTEK MB FABRIC OR EQUIV.
LOCATION: SEE REF. 2



CERAMIC SLEEVE PACKING - '2' REQ'D

SCALE: 1 1/2"=1'-0"
MATERIAL: PYROTEK A-1 ROPE C/W
GRAPHITE COATING OR EQUIV.
LOCATION: SEE REF. 2

2	ISSUED FOR DESIGN REPORT	06 MAR 66	DR	THD	JM	SR	JS
1	ISSUED GASKET LENGTH FROM 3 1/2" TO 1' 2 1/2"	15 AUG 65	OS	JM	ROB	PWS	TR
0	CHANGED FOR CONSTRUCTION	19 MAY 65	OS	JM	AA	PWS	TH
Rev.	DESIGN DESCRIPTION	Date	By	Chk'd	Approved	Released	
NOT DRAWING NO.							REV.
F-145579-35-D-0019							2
		SPEC. PROJECT					
NAME _____		145579-FINAL DBVS DESIGN					
DRAWN BY _____ CHECKED BY _____ DESIGNED BY _____ DRAWN / CHECKED _____ CALCULATED WORK _____ PROJECT NUMBER _____		U.S. DEPARTMENT OF ENERGY Office of River Protection BULK VITRIFICATION ICV BOX LID GASKET DETAILS					
DESIGN AUTHORITY _____		REV.	DRAW NO.	DESK TO	DWG NO.	NO.	
F							
Rev. AS NOTED		Date		Sheet			

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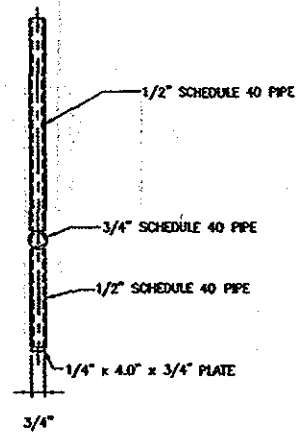
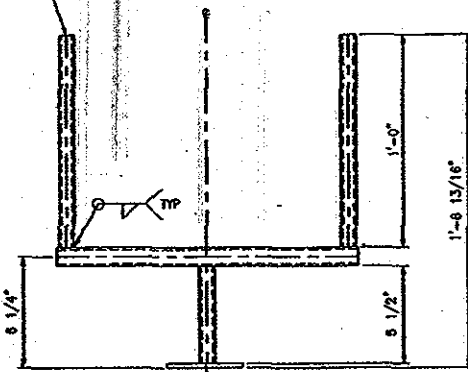
In making requests for transmittal of data by any electronic media, the Company receiving such data agrees that AMEC America Limited cannot be held responsible for errors of the data outside of or beyond the scope of our original agreement. Also, because data stored in electronic media or transmitted by electronic means can deteriorate undetected or be modified without the recipient's knowledge, the Company receiving data agrees that AMEC America Limited cannot be held liable for the compatibility, completeness or correctness of the data.

No.	AMEC Draw. No.	REFERENCE DRAWINGS
1	F-145579-35-D-0005	ICV BOX LID ASSEMBLY
2	F-145579-34-D-0002	AWTE FLOOR - AWTE DETAILS AND SECTIONS

GENERAL NOTES:

1. THE QUANTITIES LISTED FOR EACH ITEM ARE REQUIRED FOR ONE ICV BOX LID ASSEMBLY ONLY.
2. MATERIALS: AS NOTED

BREAK ALL SHARP EDGES
(TYPICAL)



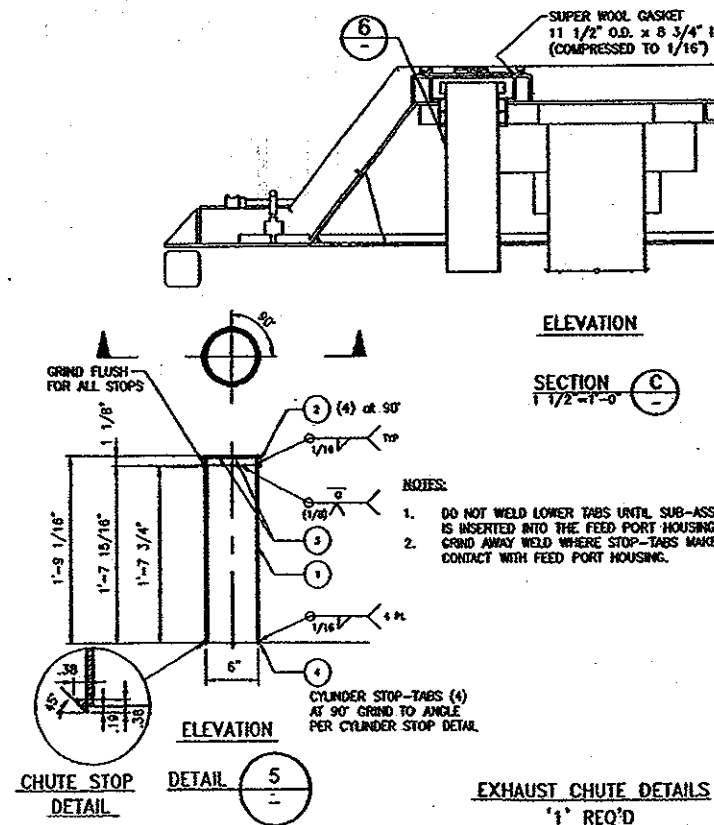
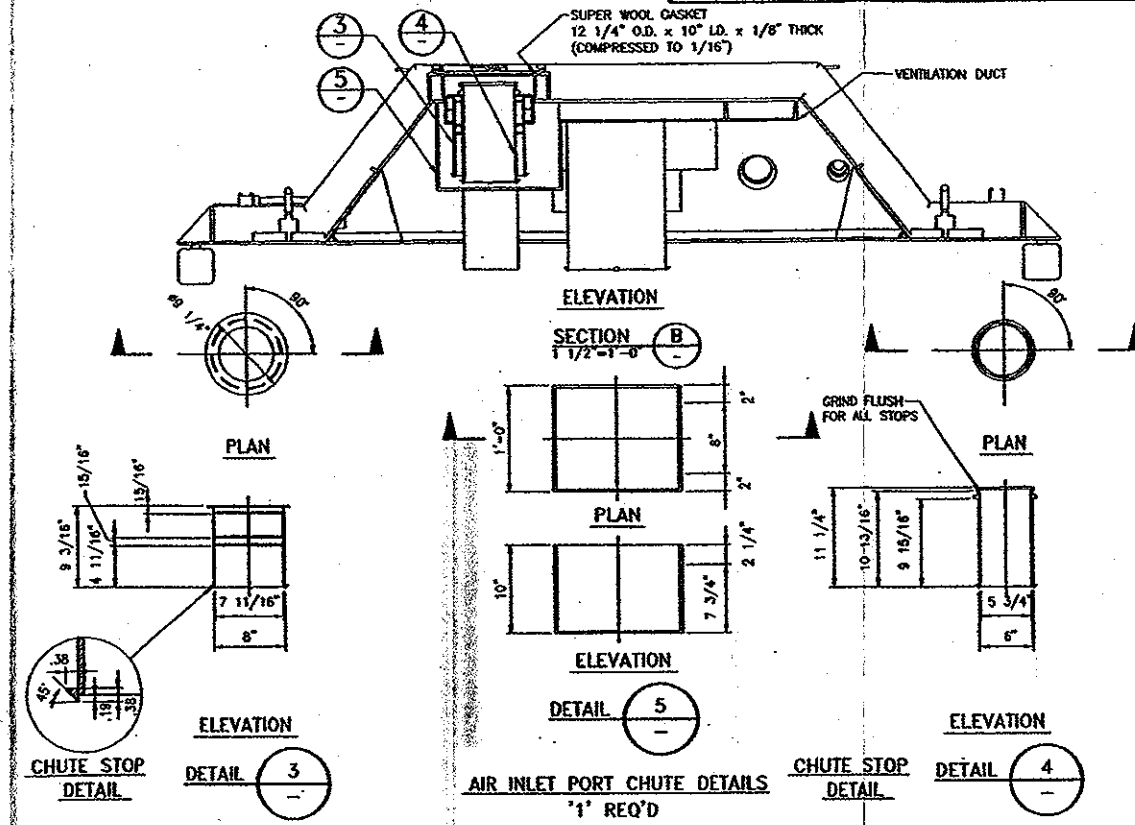
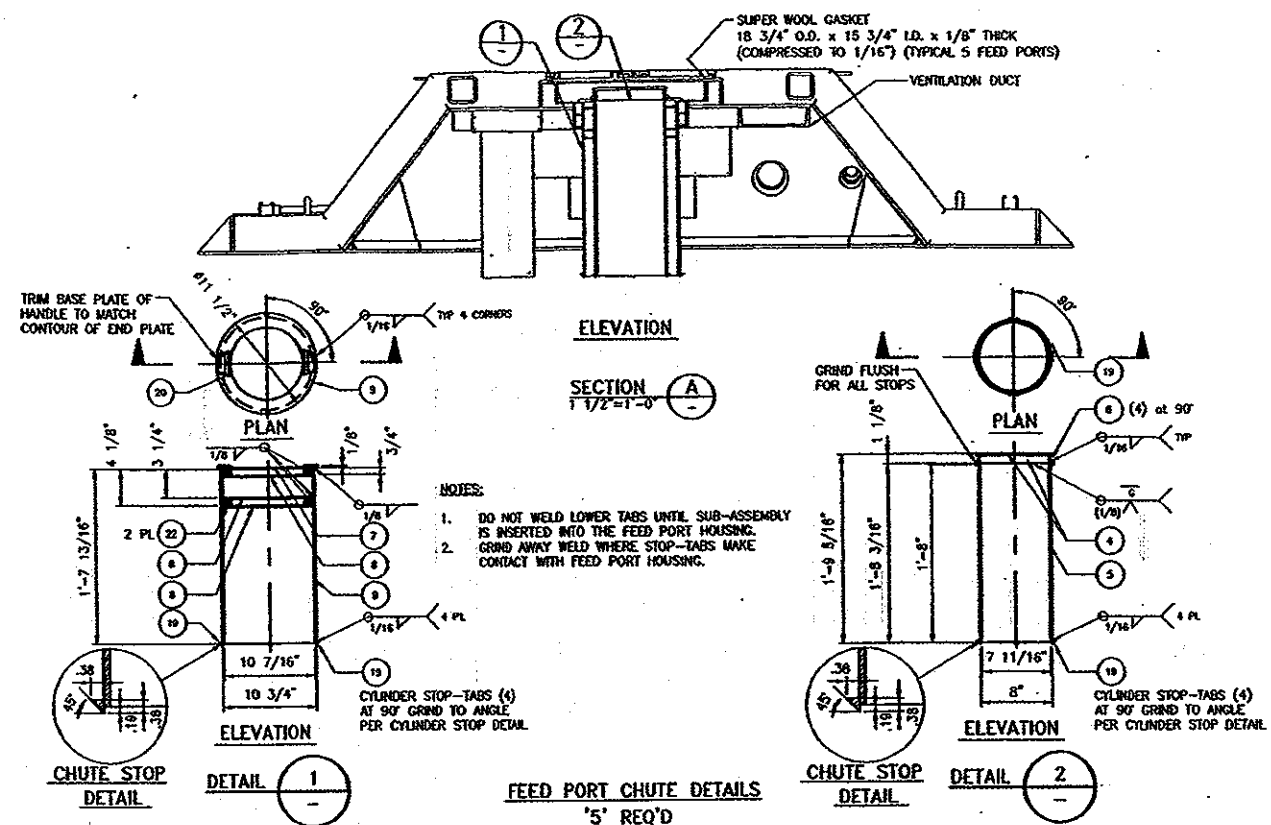
LID HANDLING TOOL - '10' REQ'D

SCALE 3" = 1'-0"
MATERIAL ASTM A36, A53

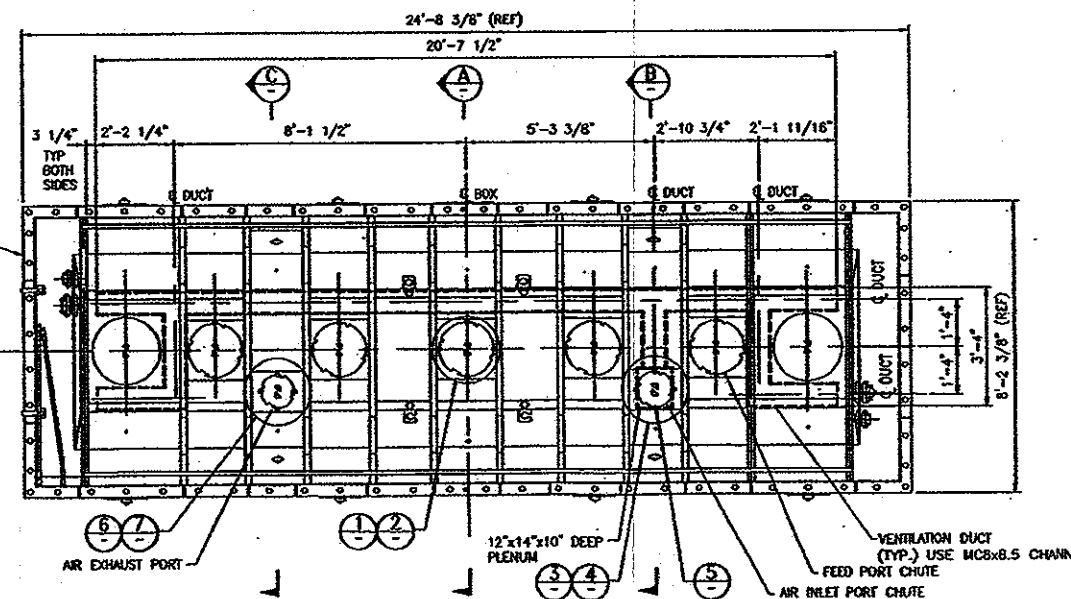
1	ISSUED FOR DESIGN PURPOSE	06 MAR 05	TH	JK	SH	JSC
2	ISSUED FOR CONSTRUCTION	19 MAY 05	AM	AA	PWS	TH
PROJECT DESCRIPTION		Date	By	CHK'D	APPROVED	DATE
F-145579-35-D-0022						1
amec		145579-FINAL DBVS DESIGN				
NAME		U.S. DEPARTMENT OF ENERGY				
DESIGNED BY		Office of River Protection				
CHECKED BY		BULK VITRIFICATION				
DESIGNED BY		ICV BOX LID				
CHECKED BY		TOOL AND RADAR PLATE				
DESIGNED BY		F				
CHECKED BY		DATE				
DESIGNED BY		DATE				
CHECKED BY		DATE				

DWG NO.	TITLE	REF NUMBER	TITLE	DESCRIPTION	REV	DATE	BY	CHK'D	APP'D
DRAWING TRACEABILITY LIST									
NEXT USED ON									
REVISIONS									

In making requests for transmittal of data by any electronic mode, the Company receiving such data agrees that AMEC American Limited cannot be held responsible for errors of the data outside of or beyond the scope of our original agreement. Also, because data stored in electronic media or transmitted by electronic means can deteriorate undetected or be modified without the consultant's knowledge, the Company receiving data agrees that AMEC American Limited cannot be held liable for the compatibility, completeness or correctness of the data.

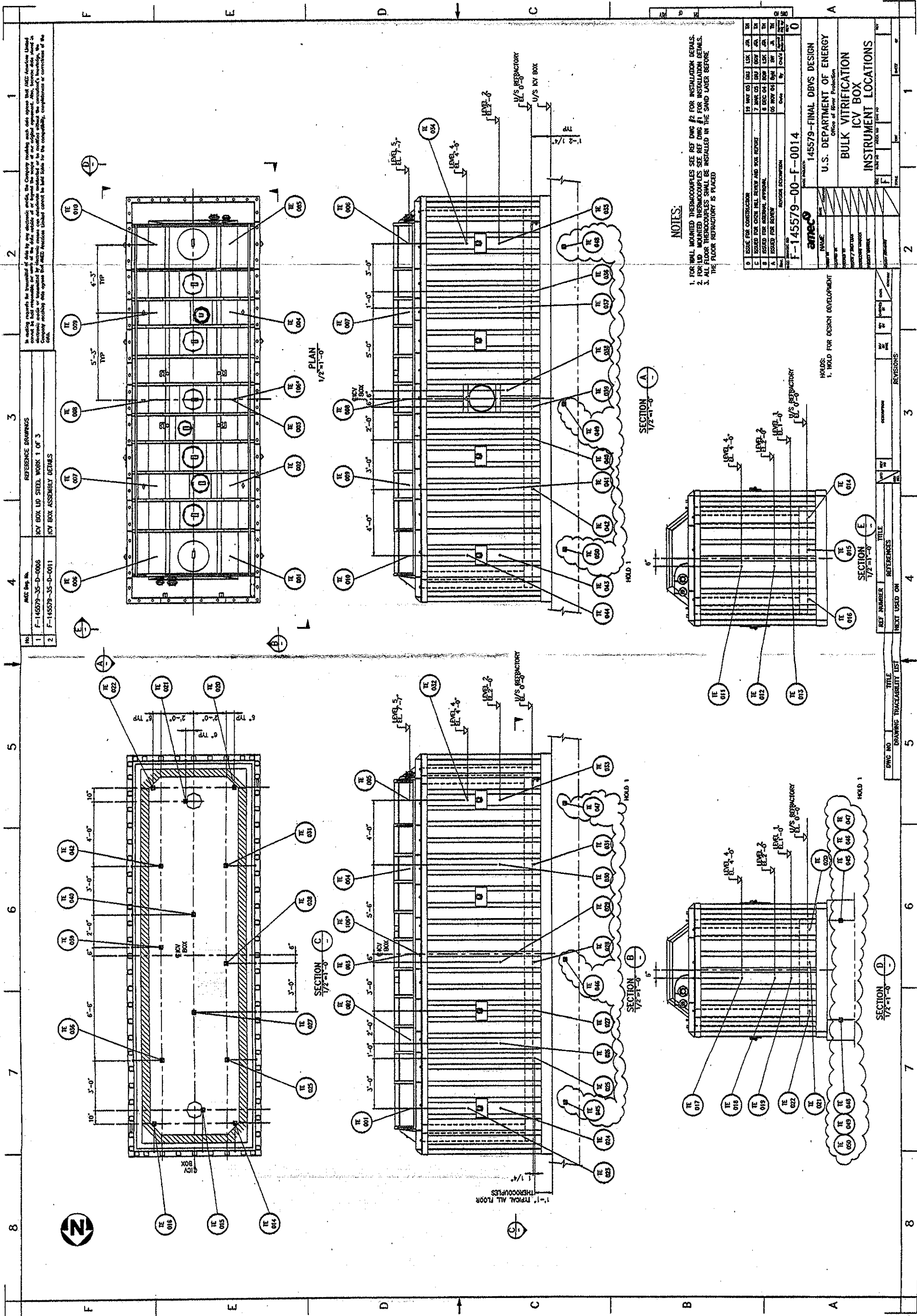


PARTS/MATERIAL LIST					
ITEM	REQ'D	PART/DRAW NUMBER	DESCRIPTION	MATERIAL/REFERENCE	QTY
1	1	-	MECH. TUBE 6"x1.34" WALL x19.93" LG	ASTM A269 TYPE 316L	1
2	8	-	PLATE, 1"x3/8"x3/8"	ASTM A240 TYPE 316L	2
3	1	-	6" I-LINE FEMALE FERRULE	BRADFORD #15W-R600	3
4	4	-	PLATE, 3/8"x3/8"x3/8"	ASTM A240 TYPE 316L	4
5	1	-	6" I-LINE FEMALE FERRULE	BRADFORD #15W-R600	5
6	-	-	MECH. TUBE, 8"x1.48" WALL x20.19" LG	-	6
7	-	-	PLATE, 3/8" THK x1.50"x38"	-	7
8	1	-	PLATE, 3/16" THK x11.50" OD x8.13" ID	A36	8
9	-	-	PLATE, 3/16" THK x10.31" OD x8.13" ID	-	9
10	1	-	PIPE, 10" SCHED 10S x 19.81" LG	A36	10
19	8	-	PLATE, 3/8"x3/8"x3/8"	A36	19
20	2	-	HANDLE - McMASTER-CARR #1647A34	HEAVY DUTY	20
22	3	-	GASKET - McMASTER-CARR #8818306	2300°F, 1"	22



REVISED KEY BOX LIP PORTS AND SELECTED RADAR PORT		DATE	BY	CHK'D	APP'D
PROJECT DESCRIPTION		DATE	BY	CHK'D	APP'D
F-145579-35-D-0024					
amec					
145579-FINAL DBVS DESIGN					
U.S. DEPARTMENT OF ENERGY					
Office of River Protection					
BULK VITRIFICATION					
ICV BOX					
PORT CONNECTIONS					
DATE	BY	CHK'D	APP'D	DATE	BY
F	AS NOTED				

DWG NO	TITLE	REF NUMBER	TITLE	REVISIONS
1	DRAWING TRACEABILITY LIST	1	REFERENCES	
2		2		
3		3		
4		4		
5		5		



APPENDIX H6

IN-CONTAINER VITRIFICATION SYSTEM

Title	Total Pages
Ceramic Sleeve Information	H6-2
Technical Specifications: <i>ICV™ Box and Lid</i> (145579-D-SP-023, Rev C) and <i>ICV™ Box and Lid Datasheet</i> (145579-D-DS-023.1, Rev C) – A Corrosion Review	H6-6
DBVS-LDS-015, Response to Corrosion Review for the ICV System	H6-7

Ceramic Sleeve
Information

MarkeTech International, Inc.

Marketing Advanced Technology • www.mkt-intl.com

4750 MAGNOLIA STREET, PORT TOWNSEND, WA 98368

Phn: (877) 452-4910

FAX: (360) 379-6907

Email: info@mkt-intl.com

January 23, 2006

AMEC Earth and Environmental
Becky Knox
GeoMelt Division
1135 Jadwin Street
Richland, WA 99352

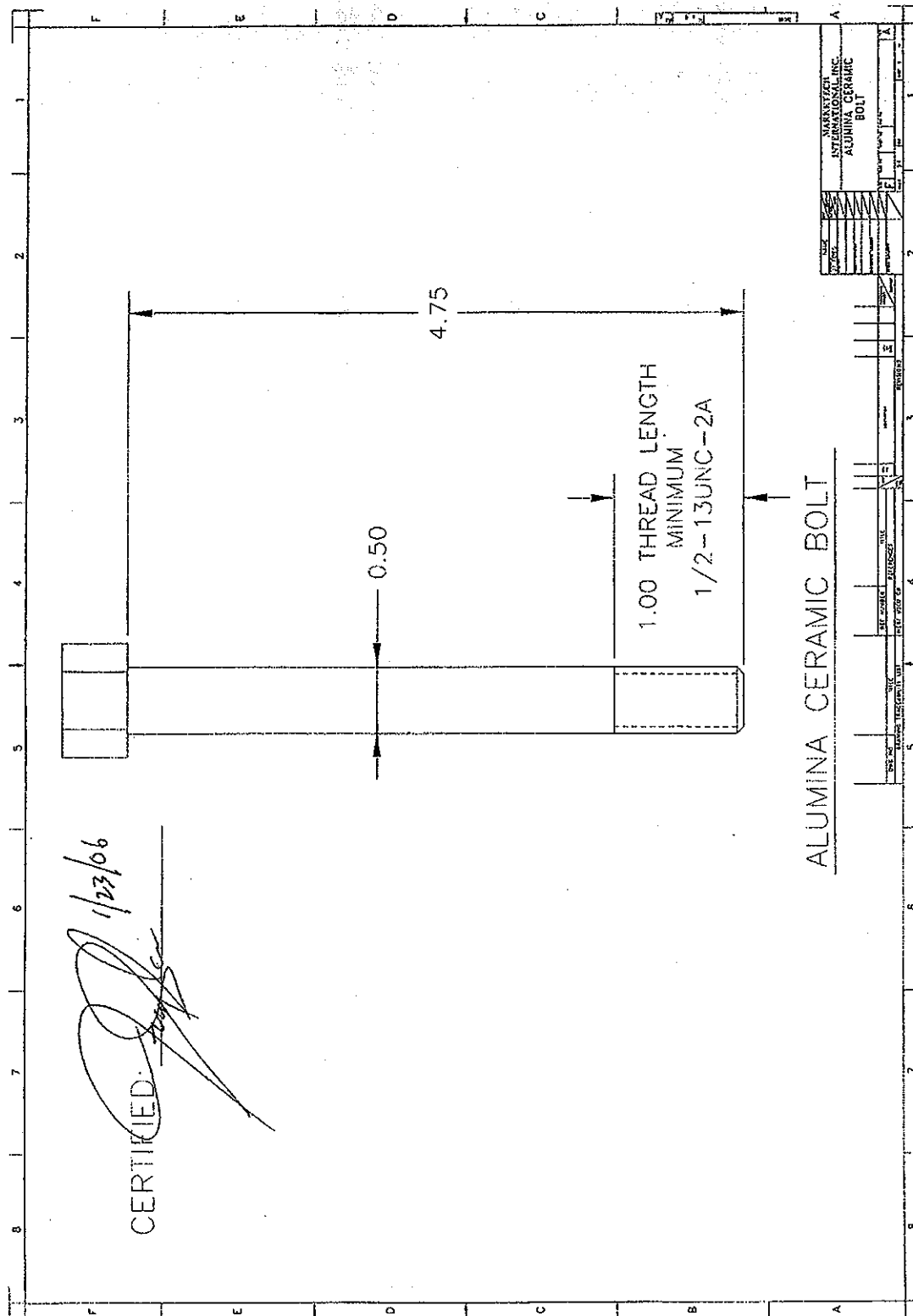
RE: Contract 05RL35A80511

Attached are the new drawings certified for this project.

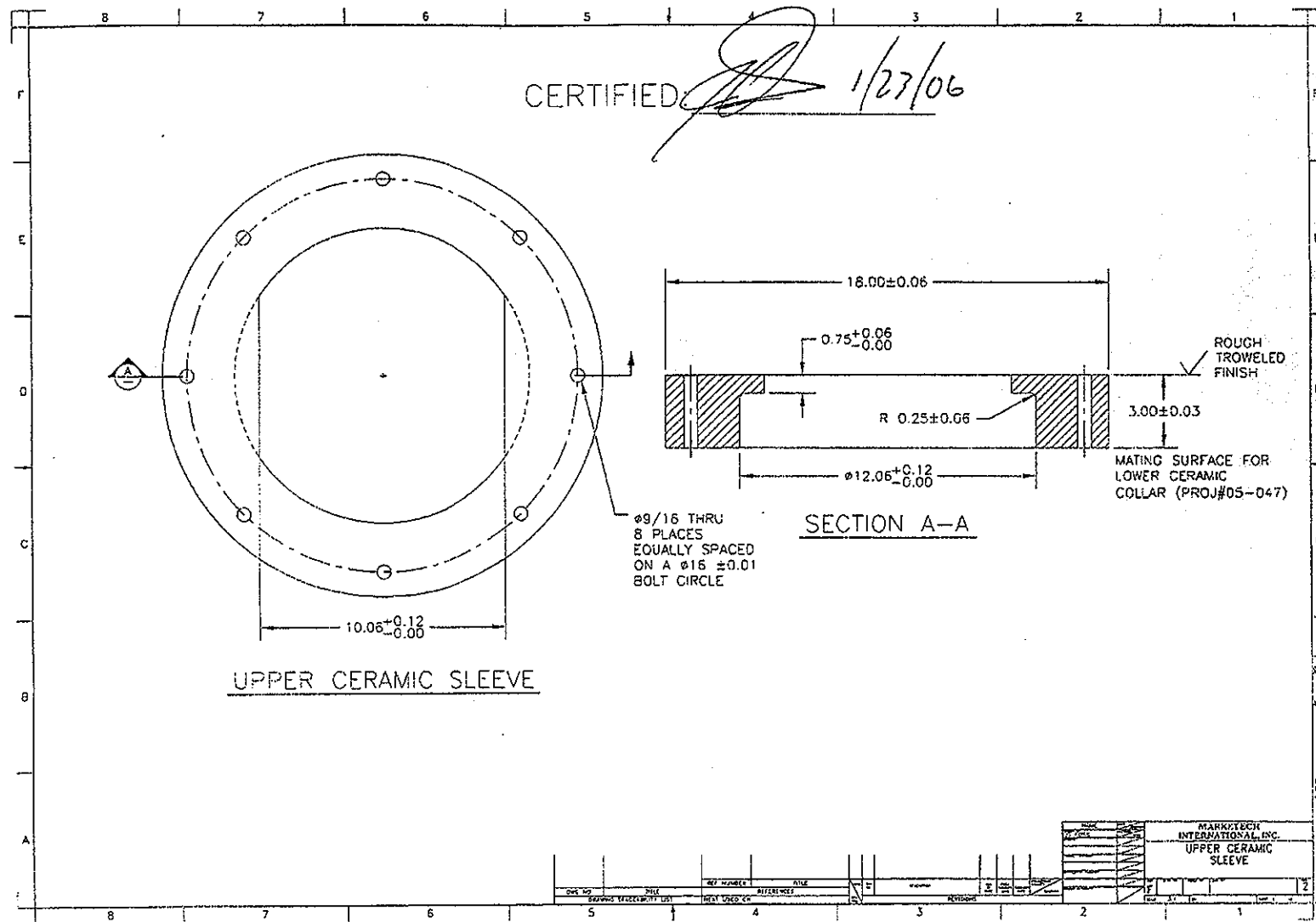
Regards,



Jerry Spieckerman
Marketch

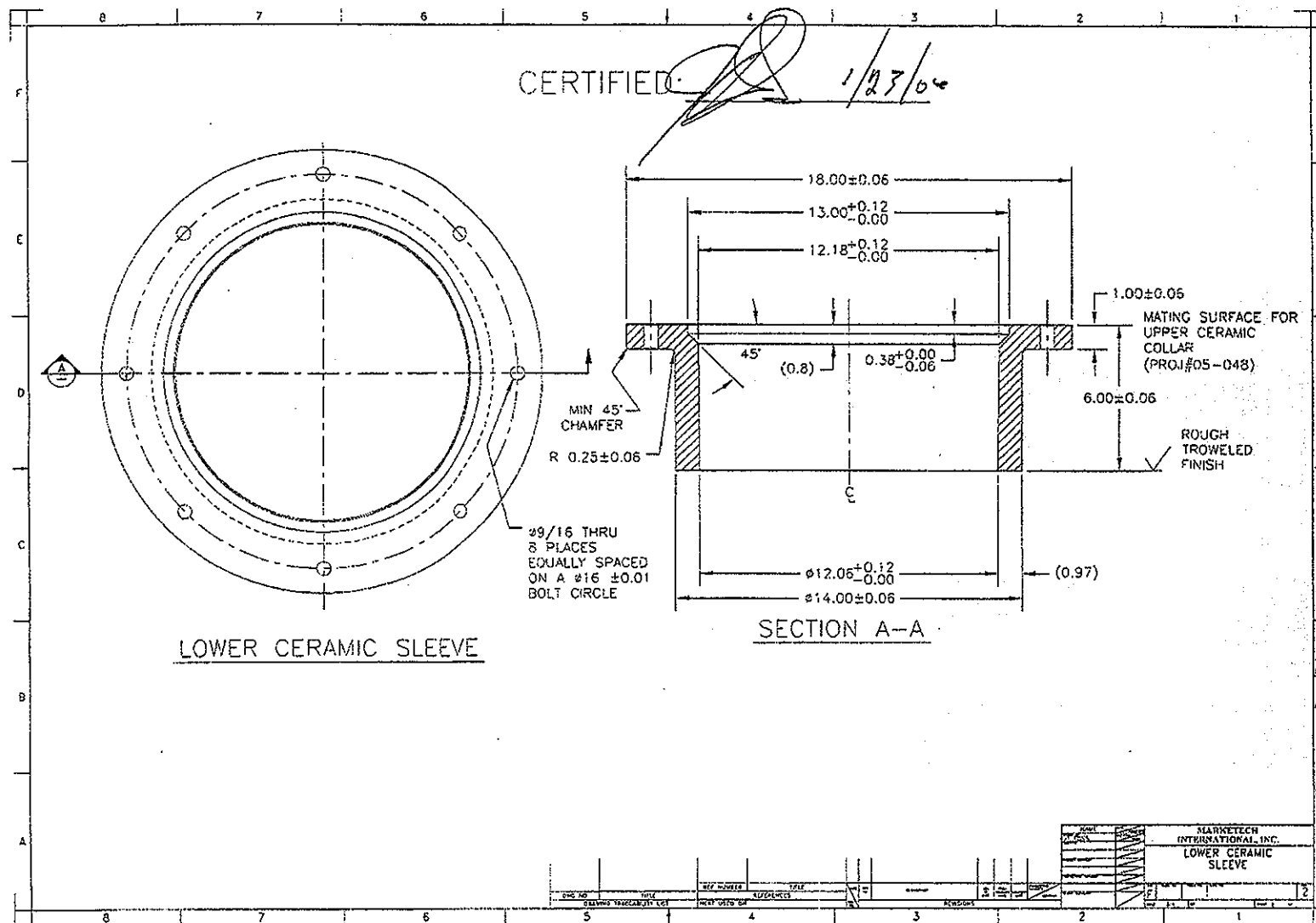


H6-4



RPP-24544 REV 1c

H6-5



RPP-24544 REV 1c

CHEM MET, LTD, PC

POB 4068

West Richland, WA 99353

509-967-2309 fax 967-2459

Your single source for Chemical, Materials, and Environmental Technology

March 14, 2005

Charles E. Grenard
DMJM Technologies
3250 Port of Benton Blvd
Richland, WA 99354-1670

Dear Mr Grenard

Technical Specifications: *ICV™ Box and Lid* (145579-D-SP-023, Rev C) and *ICV™ Box and Lid Datasheet* (145579-D-DS-023.1, Rev C) – A Corrosion Review

This document presents a limited number of general remarks about corrosion in the specifications and recommendations.

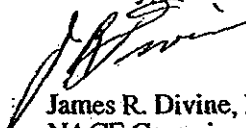
***ICV™ Box and Lid* (145579-D-SP-023, Rev C) and *ICV™ Box and Lid Datasheet* (145579-D-DS-023.1, Rev C)**

There are no comments on this specification and its datasheet.

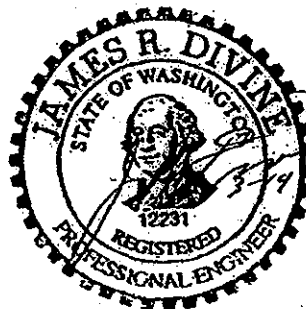
General Recommendations

In addition, the scaling temperature of carbon steel in air is about 900 °F. Scaling increases rapidly above this temperature, and is strongly affected by impurities in the gasses. Rather than use an ordinary carbon steel, one with chromium and molybdenum will raise the scaling temperature. One possible material is A387 (UNS 41545) with about 5% Cr and 0.5% Mo – the scaling temperature would increase to about 1150 °F. Other, more expensive alloys are available. Ideally, your melter vendor will have a complete list of suitable alloys on hand – they may even be able to demonstrate that the existing material is satisfactory.

Sincerely,



James R. Divine, PhD, PE
NACE Corrosion Specialist, #867
Chief Engineer



EXPIRES: 3-11-06

Corrosion Review
Response



3250 Port of Benton Blvd
MSIN H0-50
Richland, WA 99354-1670
T 509.375.7774
F 509.375.5331

April 15, 2005

DBVS-LDS-015

Mr. James R. Divine
ChemMet, Ltd. PC
P.O. Box 4068
West Richland, Washington 99353

References: 1) Technical Specification 145579-D-SP-023, Rev. C, *ICV™ Box and Lid*, and
Data Sheet 145579-D-DS-023.1, Rev. C, *ICV™ Box and Lid Datasheet—*
A Corrosion Review, dated March 14, 2005.

SUBJECT: RESPONSE TO CORROSION REVIEW FOR THE ICV SYSTEM

Dear Mr. Divine,

DMJMH+N, Inc. (dba DMJM Technology) recently contracted with ChemMet, Ltd. to conduct a corrosion review on various systems and components for the Demonstration Bulk Vitrification System (DBVS) Project.

Table 1 denotes our planned actions to address your comments, issues, and concerns stated in your review of the DBVS equipment specifications.

Thank you for your corrosion review on the DBVS ICV System.

Respectfully,

A handwritten signature in cursive script, appearing to read "Kurt J. McCracken".

Kurt J. McCracken
Chief Engineer

A handwritten signature in cursive script, appearing to read "Ja-Kael Luey for James R. Fredrickson".

James R. Fredrickson
DBVS Project Manager

cc: DMJM Technology

CH2M HILL Hanford Group, Inc.

James Frederickson
Kurt McCracken
Ja-Kael Luey
DMJM File/LB

Mike Leonard
Dave Shuford

AMEC Earth and Environmental

Leo Thompson
Mark Lucas

Mr. James R. Divine
 DBVS-LDS-015
 April 15, 2005
 Page 2 of 2

Table 1. In-Container Vitrification System.

Item	Section	Comment or Recommendation	Disposition or Planned Action
Technical Specification 14559-D-SF-03, Rev. C, <i>ICV™ Box and Lid</i> , and Data Sheet 14559-D-DS-023.1, Rev. C, <i>ICV™ Box and Lid Datasheet</i>			
1.	N/A	There are no comments on this specification and its datasheet.	Accepted.
General Recommendations			
2.	N/A	In addition, the scaling temperature of carbon steel in air is about 900 °F. Scaling increases rapidly above this temperature, and is strongly affected by impurities in the gasses. Rather than use an ordinary carbon steel, one with chromium and molybdenum will raise the scaling temperature. Once possible material is A387 (UNS 41545) with about 5% Cr and 0.5% Mo – the scaling temperature would increase to about 1150 °F. Other, more expensive alloys are available. Ideally, your melter vendor will have a complete list of suitable alloys on hand – they may even be able to demonstrate that the existing material is satisfactory.	The ICV Box Lid material and design are presently under review to address temperature concerns. The ICV Box material will be re-evaluated using the results and analysis from full-scale testing being performed with a representative ICV box and non-radioactive test material.